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The IRON AGE

DECEMBER 4, 1947

FERRO-ALLOY

Symbols of metallurgical progress

DEPENDABILITY
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Dressed to sell

Better electric motors
through
JACK & HEINTZ
Mass Precision

Every day, thousands of J & H electric motors step out into industry—smooth-lined and shiny—*dressed to sell.* Tops in appearance and performance, and backed by the world-wide reputation of Jack & Heintz for precision workmanship, these J & H motors enhance the sales appeal of the appliances and machines they power. Their features are described in Bul. SF-3200, free on request.

JACK & HEINTZ PRECISION INDUSTRIES, INC., *Cleveland 1, Ohi*

Announces

Two new instruments for saving production time and materials

Here are two new G-E quality-control instruments. Like all G-E testing and measuring equipments, they have been proved in our laboratories and on our production lines.

Good quality control means a saving in hours and dollars to you. Cutting down such waste as avoidable trimmings or excessive rejects can mean big savings to you over a year's period. For help on such individual quality-control problems, state your request in detail. Our engineers can pick from hundreds of equipments to help you with quality control. *Apparatus Department, General Electric Company, Schenectady* 5, *N. Y.*

HAND TACHOMETER SIMPLIFIES SPEED MEASUREMENT

The new hand tachometer gives you quick accurate speed indication at low cost. You can adjust the speed of such equipments as motors, cutting lathes, and other machinery to obtain the best operating conditions. Covering an unusually wide range, it weighs only seven pounds. Machinery users and manufacturers both find this new tachometer useful. Write for Bulletin GEA-4895.

METALS COMPARATOR SEPARATES METALS QUICKLY

The new metals comparator sorts metals on basis of chemical composition and heat treatment. Useful for both magnetic and non-magnetic metals. It's portable, economical with an easy-to-read scale. Saves money in metals stockroom by identifying mixed metals. Reduces cutting tool losses by separating machinable from non-machinable metals. Permits rapid inspection—1200 to 1500 parts per hour. Write for Bulletin GEA-4894.

This new Specialized Measuring and Testing Equipment Catalog contains 44 pages of the latest developments in measuring and testing equipment, giving application, description, specifications, photographs, prices and how to order. Here, in easy-to-use form, is assembled information on approximately 100 equipments. If you can use a catalog of this type, fill out the coupon completely and send it today.

SPECIALIZED TESTING AND MEASURING EQUIPMENT CATALOG

GENERAL ELECTRIC

NEW FREE CATALOG for REFERENCE and ORDERING

Apparatus Department
General Electric Co., Section E800-38
Schenectady 5, N. Y.

Please send me the new SPECIALIZED MEASURING AND TESTING EQUIPMENT CAT., GEA-639.

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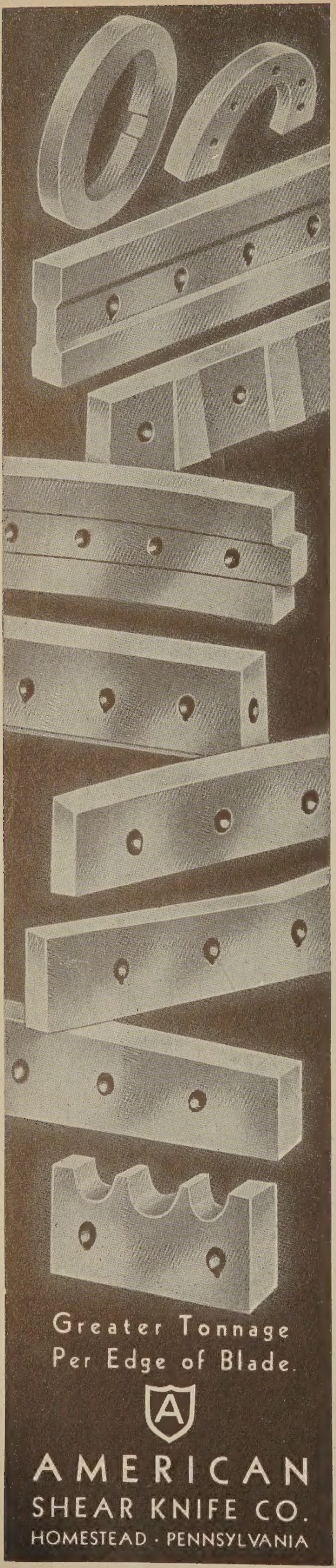
Company ....
Position ....
Street ....
City .... **Zone** ..... **State** ....

GENERAL ELECTRIC



Fatigue Cracks

BY C. T. POST

Whoo-o-o, Whoo-o-o!

• • Next time you're in New York, don't forget to call MUrray Hill 3-2707. In case you're curious, the first sound you'll hear is the authoritative "Whoo-o-o, whoo-o-o" of a locomotive whistling for a grade crossing. Then, a sweet, young voice chimes in, "Lionel Trains."

An operative we sent over to make a quiet investigation of the Lionel offices, 15 E. 26th St., reports that each swtichboard operator has an air whistle operated by foot treadle. To give precisely the right effect requires a fine sense of timing. That is, the girl has to come in fast with "Lionel Trains" before the buyer from Macy's gets scared and slams down the phone.

Of course this idea could never be borrowed by the Long Island Oyster Association, but it still presents a wealth of possibilities. For one thing, we hope Chuck Luckman, president of Lever Brothers, and former head of the food saving program, never gets hold of it. It would be the final straw on saving food for Europe if some farm belt bureaucrat, calling up Luckman to cuss him out for meatless Tuesday should be greeted with "Bee-e-e-O, Lifebuoy."

History

• • For a modest fee, any one of a number of scissor-crazy services will agree to read every periodical in the United States and send you a clipping each time your name appears in print. As insurance against its contemporaries ever challenging your favorite family journal's standing as the most widely quoted industrial publication in the world, such a service buries one of the promotion department's desks each week with clippings mentioning the magic words "I — — — A — —."

So it was that an article on the development of metals from another metalworking publication was neatly penciled and delivered the other day on the basis of this sentence:

"The Copper Age followed the Stone Age, and was, in turn, superseded by the Iron Age."

Just so there won't be any misunderstanding, we think it only fair to inform the author of that piece that there was quite a lag between the Copper Age and the Iron Age. THE IRON AGE didn't roll off the press for the first time until 1855.

Smokestacks

• • Note to Frank T. Sisco, Alloys of Iron Research of The Engineering Foundation: Running down your tip, we telephoned the Consolidated Edison powerhouse at 39th and East River, New York, to check on the height of their stacks. We held the phone for about ten minutes while the chief engineer sent a boy up to the top of the tallest one. When he came down, he reported it was 234 ft. above the roof, and looking down from the top, the roof looked another 200 ft. from the ground. That stack isn't in the running for the world's tallest, but your guess that your 30th floor apartment, from which you estimated the stack's height, was 350 ft. above the River was almost on the button. Thanks a million for the help.

Meanwhile, we've polished off some more tall stories on the tall stacks. American Smelting & Refining has squashed the rumor that their El Paso zinc smelter stack is taller than their Selby lead smelter chimney. Selby, they say, is 600 ft. in the air, about 275 ft. higher than originally estimated by West Coast Editor Bob Reinhardt.

International Nickel is proud that its Copper Cliff, Ontario, stack, 554 ft. high, is the tallest in the British Empire. But the Nickel Co. points out that the Phelps-Dodge stack at Morenci, Ariz., rises 600 ft. from its foundation, an exact tie with Selby. Phelps-Dodge claims the title, though, on the basis that its stack has a 12-ft foundation, while Selby goes only 5 ft to bed rock.

Julian L. Hayes of Anaconda Copper Mining Co., who supported Reader John A. Davenport's nomination of the 585 ft Anaconda, Mont. (not Butte) stack, takes home the consolation prize. Both Mr. Hayes and Reader J. J. Reich of Huntington, W. Va., quote the Alphons Custodis Chimney Construction Co. as authority that the Anaconda stack has an inside top diameter of 60 ft while Selby and Morenci are comparatively skinny (Selby: 13 ft). Thus you could drop either Selby or Morenci down the Anaconda stack, if a roguish desire struck you, but it would stick out the top.

There's a nasty rumor concerning a prewar Jap claim to the title, but we have little doubt that whatever rubble is left does not now rise more than 25 or 30 ft off the ground.

RODUCT-PROVED STEEL . . .
OLD UNDER WELL-KNOWN TRADEMARKS

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- Farm Fence
- Poultry Fence
- Lawn Fence
- Chain Link Fence
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- Nails
- Staples
- nufacturers' Wire

Sheet Products

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- Special Coated Sheets
- Konik Sheets
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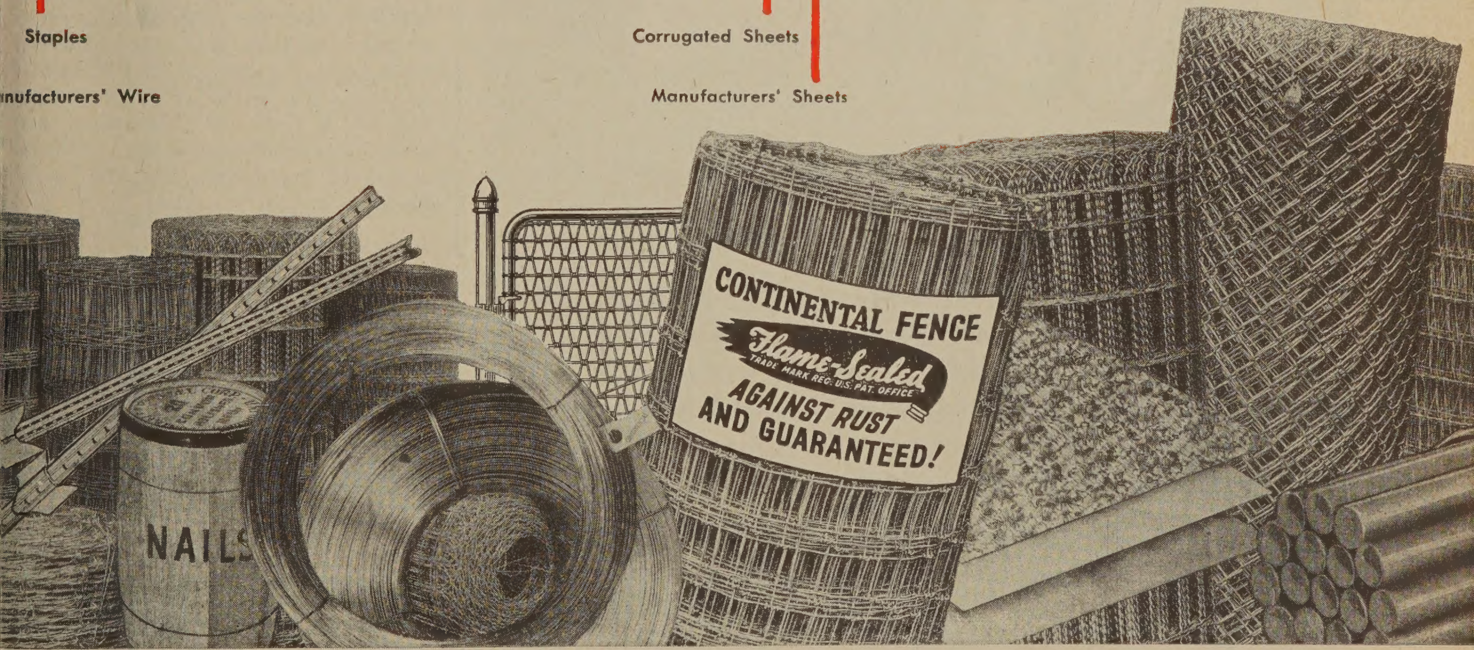
- Culvert Sheets
- Corrugated Sheets
- Manufacturers' Sheets

● Hundreds of manufacturers . . . both large and small . . . are building or strengthening their business reputations on products made entirely or in part from Continental steel. Their faith in Continental quality is attested to by the fact that they place their own valuable trademarks on these products in which Continental wire or sheet steel is used.

Sold under Continental's own well-known trademarks, are many wire or sheet steel products made in our plant for farm, home and industrial markets. These trademarks have been established through fifty years of steel-making progress. Write Continental at Kokomo for further information.



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UNIFORM SPANGLE Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot

ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain

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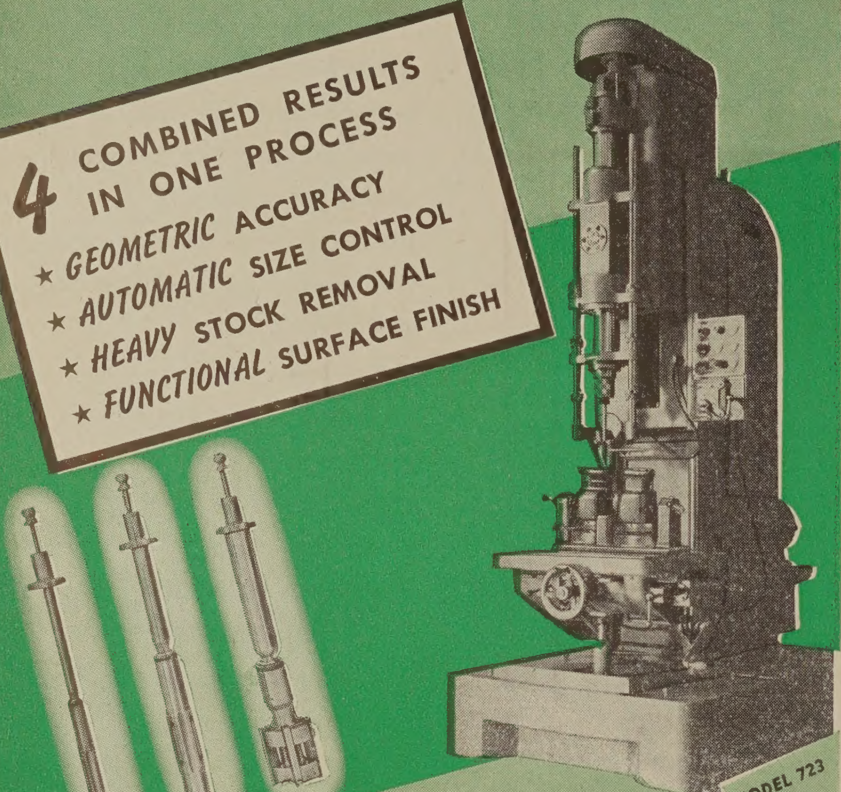
MICROHONING is
AUTOMATIC
PROCESSING CONTROL



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IN ONE PROCESS
★ GEOMETRIC ACCURACY
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in many different installations have cut total processing by one or two operations—have reduced the over-all amount of waste stock removal—have generated uniform final size AUTOMATICALLY within 0.0001 to 0.0003-inch—eliminated selective fits in some parts—reduced inspections to one or two spot checks per shift.

The highlights of Modern Microhoning are available in sets of several booklets. Don't you want a set?

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Dear Editor:

FREIGHT RATES

Sir:

The article, "Rail Freight Rate Increases Called Blow to Pittsburg Mills" in the Oct. 30 issue, has bee noted with interest. You mentione that in 1913 Pittsburgh producers ha to absorb 6¢ per cwt on hot-rolle sheets sold in the New York City market in competition with sheets mad at Sparrows Point, Md. Of course, i 1913 hot-rolled sheets were called blu annealed sheets, and they were sol f.o.b. Pittsburgh, there being no Sparrows Point basing price. Similarly, i 1915, the Pittsburgh maker did no absorb 5¢ in shipping to Toledo, a there was no Cleveland base. The there was no Middletown base o sheets until the last decade so that the Pittsburgh manufacturer did not have to dig down in his jeans on shipments to Louisville. The facts of the matte are that when steel was sold f.o.b. Pittsburgh, the makers located at Pittsburgh always received their mil price. The makers at points such as Chicago, merely secured a high yield on material furnished in their own local territory.

It seems to me that any absorption by the Pittsburgh makers would be one of their own choosing, as the buyers of steel today would welcome a chance to pay the few extra points involved in shipping steel from any point where it might be secured. As I recall it, the rate from Pittsburgh to Chicago in 1913 was approximately 14.9¢, and the rate from Chicago to St. Louis was probably 9¢, so freight was not a problem. The proper balance of terms of sale of steel products is one of the major problems facing the steel industry today.

W. F. KURFESS

Milwaukee

● We appreciate your bringing this matter to our attention. If we had used the word "differential" for "absorption" in the middle of the three charts, the basing point problem would have been straightened out. Actually, differential applies to the early part of the charts; absorption to the latter portions. We realize that the basing point system did not become widespread until NRA days, and that prior to 1924, pricing was on a "Pittsburgh plus" basis.—Ed.

CARBIDE DIES AND PUNCHES

Sir:

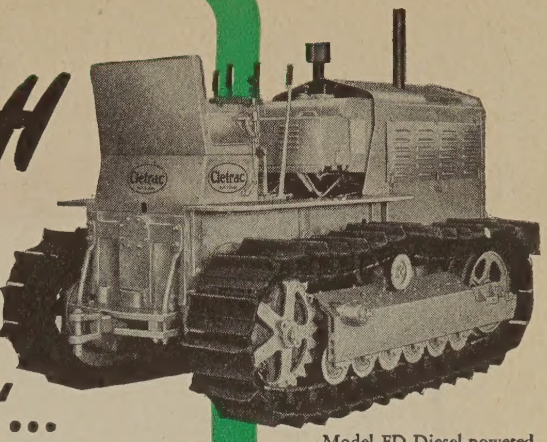
Several months ago there was a short article pertaining to the use of high-speed steel punches used in conjunction with carbide dies. As I recall, one of the large electric motor manufacturers found the combination of these two materials on certain jobs were outperforming dies and punches both made of carbide. I would appreci-

STRONG-TOUGH

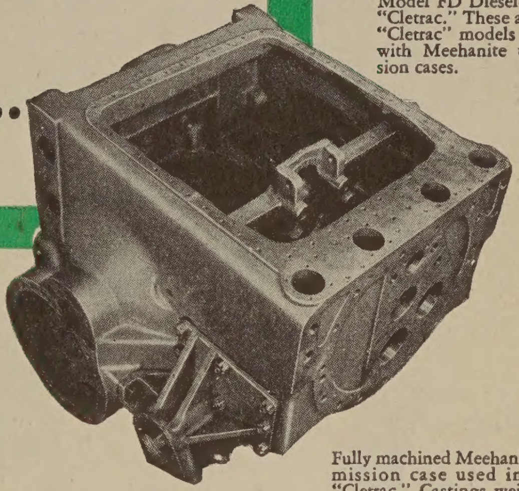
BUILT FOR SERVICE

The Oliver Corporation's "CLETRAC"...

MEEHANITE® Transmission Case...



Model FD Diesel-powered "Cletrac." These and other "Cletrac" models are built with Meehanite transmission cases.



Fully machined Meehanite transmission case used in Oliver "Cletrac." Castings weigh 2200 lbs. Produced by Johnstone Foundries Inc., Grove City, Pa.

The Diesel-powered "Cletrac" built by The Oliver Corporation, Cleveland, Ohio, combines in its design and construction the results of 30 years' research and experience. Only the highest quality in materials and workmanship can meet their rigid specifications.

The Meehanite transmission case illustrated meets their requirements for a high strength, tough, dimensionally accurate unit,—a vital part of the powerful mechanism. Specifications require a minimum tensile strength of 50,000 psi (1.2" Dia. cast-on coupon) and controlled Brinell hardness within the range of 220-240. Castings must be completely free of any defects or misalignment; must be readily machinable; (note numerous machining operations performed) and in fact must embody all the better engineering characteristics for which Meehanite castings are noted.

For the right combination of properties for *your* job specify Meehanite castings.

Write for the Meehanite Handbook and send your casting problems to . . .

MEEHANITE®

PERSHING SQUARE BUILDING
NEW ROCHELLE, N. Y.

MEEHANITE FOUNDRIES

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
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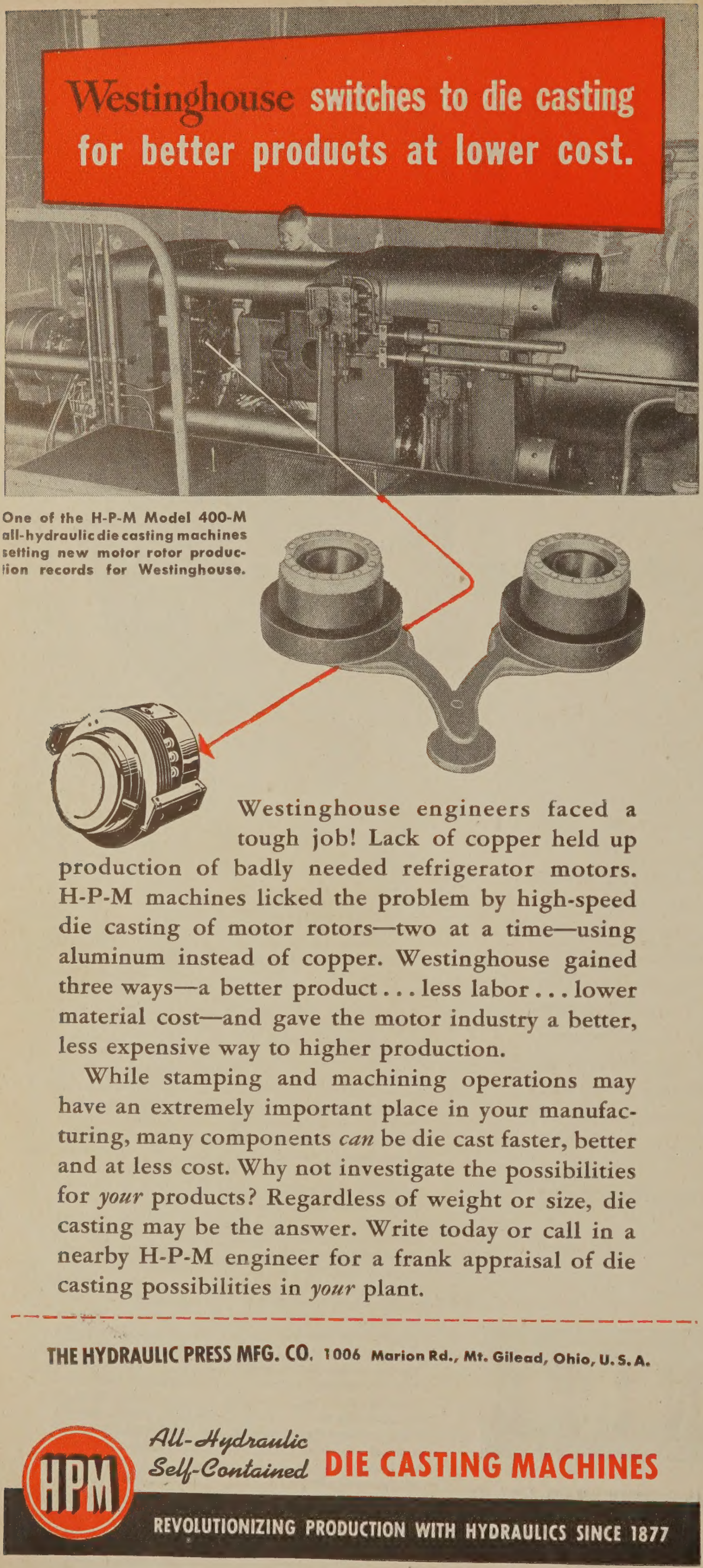
Barnett Foundry & Machine Co.	Irvington, New Jersey
Builders Iron Foundry Inc.	Providence, R. I.
H. W. Butterworth & Sons Co.	Bethayres, Pennsylvania
Continental Gin Co.	Birmingham, Alabama
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co.	Portland, Oregon
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Kanawha Manufacturing Co.	Charleston, West Virginia
Koehring Co.	Milwaukee, Wisconsin
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Lincoln Foundry Corp.	Los Angeles, California
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Vulcan Foundry Co.	Oakland, California
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey
Washington Machinery & Supply Co.	Spokane, Washington
E. Long Ltd.	Orillia, Ontario
Otis-Fensom Elevator Co., Ltd.	Hamilton, Ontario

"This advertisement sponsored by foundries listed above."



Westinghouse switches to die casting for better products at lower cost.

One of the H-P-M Model 400-M all-hydraulic die casting machines setting new motor rotor production records for Westinghouse.

Westinghouse engineers faced a tough job! Lack of copper held up production of badly needed refrigerator motors. H-P-M machines licked the problem by high-speed die casting of motor rotors—two at a time—using aluminum instead of copper. Westinghouse gained three ways—a better product . . . less labor . . . lower material cost—and gave the motor industry a better, less expensive way to higher production.

While stamping and machining operations may have an extremely important place in your manufacturing, many components *can* be die cast faster, better and at less cost. Why not investigate the possibilities for *your* products? Regardless of weight or size, die casting may be the answer. Write today or call in a nearby H-P-M engineer for a frank appraisal of die casting possibilities in *your* plant.

THE HYDRAULIC PRESS MFG. CO. 1006 Marion Rd., Mt. Gilead, Ohio, U. S. A.

HPM *All-Hydraulic Self-Contained* **DIE CASTING MACHINES**

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877

ate your advising me as to which issue this article appeared in and if you have tear sheets available.

BENJ. P. TEST
Vanadium-Alloys Steel Co.
Latrobe, Pa.

● Tear sheets of the article "Cemented Carbide Used for High Production Dies and Punches" which appeared in the Aug. 28 issue, are being mailed.—Ed.

APPRECIATION

Sir:

It's great! We mean the booklet, "The Iron Age Directory of Tool Steels" . . . Would it be possible for us to obtain six copies of this booklet for use in our Tool Design Catalog Reference Library?

D. H. DUFFY
Leadman-Tool Design Group
Beech Aircraft Corp.
Wichita, Kans.

● The directory is available to subscribers at $2.00 each for one or two copies; $4.50 for three copies; $1.00 each for six or more copies.—Ed.

SIGHTLESS VETS

Sir:

In the Oct. 9 issue there was a picture of some blinded veterans at work, the caption over the picture being "Jobs for Sightless Vets." With your permission we would like to reprint the picture in an issue of our bulletin which goes out to blinded veterans all over the country.

CHARLES A. SILLIMAN
Editor, BVA Bulletin
Blinded Veterans Assn.
New York

● We are forwarding the photograph which originated with General Motors Corp.—Ed.

THREAD ROLLING

Sir:

In the issues of Dec. 19 and 26, 1946 and Jan. 9, 1947 appeared a series of articles by J. W. Batchelder entitled "Thread Rolling—Theory and Practice." I am interested in obtaining copies of these articles if they are available.

P. H. TIERNEY
Office of the Purchasing Engineer
Eastman Kodak Co.
Rochester

● Reprints are available to readers at $1.00 per copy.—Ed.

EQUIPMENT FOR STANFORD

Sir:

The transition to peacetime education at Stanford University has included the establishment of a program of study in the field of gas turbines and jet propulsion. The greatest need at the moment is for representative gas turbine parts that can be used as instruction models. Also, old or surplus jet engine units that can be sectioned to show the flow of the working medium through the various parts of the cycle are urgently needed. It would be greatly appreciated if you will call

Michigan WELDED STEEL TUBING

The Modern Electric Resistance Welded Steel Tube

ROUND

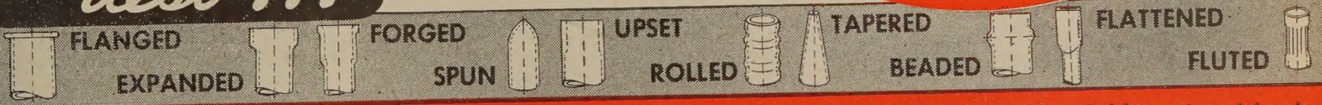
¼" to 4" O.D.
9 to 22 gauge

SQUARE • RECTANGULAR

½" to 2" 20 gauge—1" to 2¾" 14, 16, 18 gauge

Because it re-forms and machines so well, Michigan Welded Steel Tubing is widely used in the fabrication of production parts such as automobile exhaust and muffler tail pipes, gas tank filler tubes, steering jackets, and wherever bent and shaped tubes may be required. True concentricity, uniform I.D. and O.D. make it particularly economical when long runs are involved.

Can be BENT *also . . .*



Engineering advice and technical help in the selection of tubing best suited to your needs. Address inquiries to:

Michigan STEEL TUBE *PRODUCTS CO.*

More Than 30 Years in the Business
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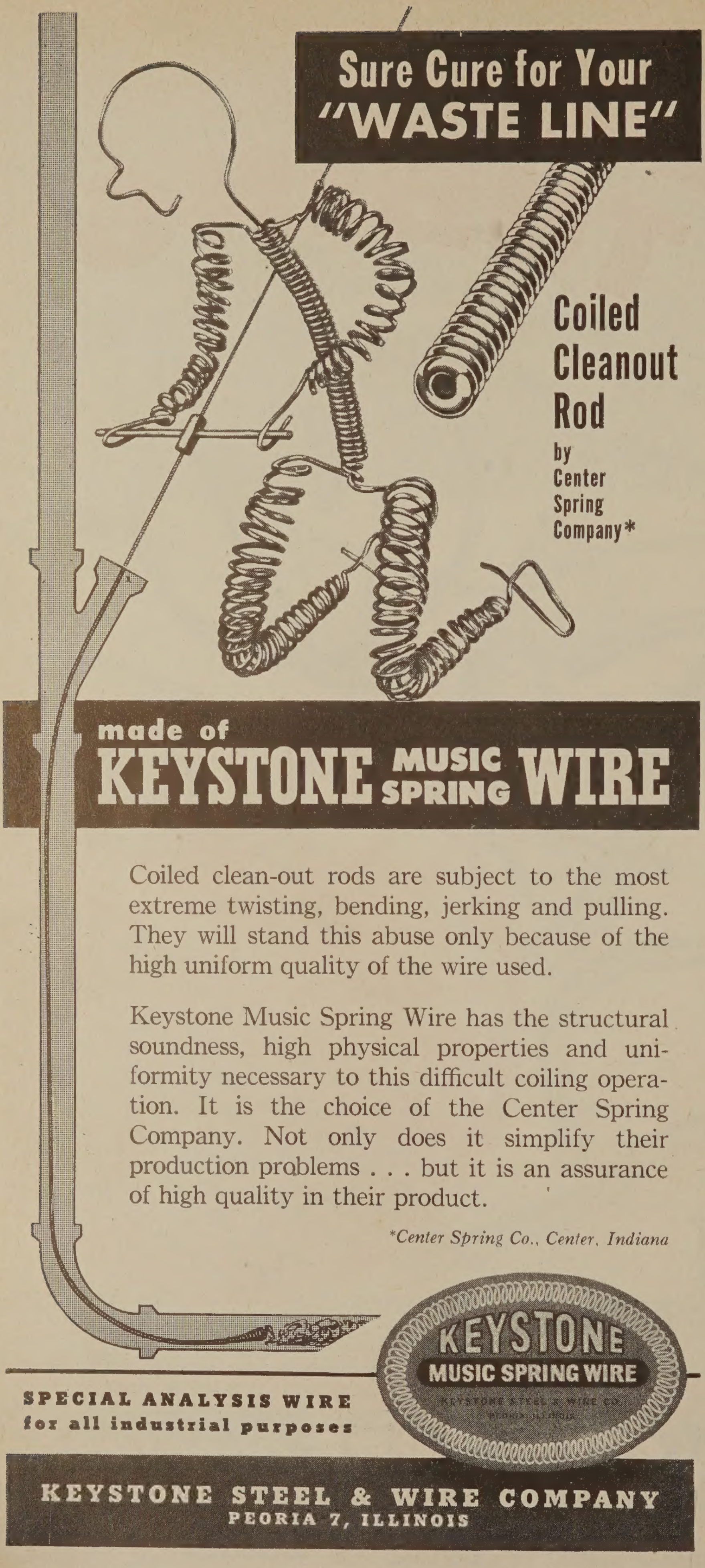

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made of KEYSTONE MUSIC SPRING WIRE

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*Center Spring Co., Center, Indiana

KEYSTONE MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

this to the attention of your readers Anyone having knowledge of th availability of such items can communicate with me at the Mechanica Engineering Laboratory, Stanfor University, Stanford, Calif.

V. C. FINCH

Stanford University
Stanford, Calif.

NEW ALLOY DIE

Sir:

Would you please advise **if ther** has been an article recently published in The Iron Age discussing the new alloy die recently developed by the Ford Motor Co. . . . Your assistance would be greatly appreciated.

M. R. DUMAS

American Bosch Corp.
Springfield, Mass.

- See the Assembly Line, Sept. 11, p. 204. —Ed.

IN AGREEMENT

Sir:

. . . We regularly and very closely follow T. W. Lippert's editorials and are usually heartily and fully in agreement with him.

H. O. BATES

Acromark Co.
Elizabeth, N. J.

STEEL SHOT CLEANING

Sir:

Being interested in steel shot cleaning apparatus for ships' hulls and the like, and no continental information on this point available, we kindly beg you to inform us about possible suppliers in your country of this type of machinery . . .

J. C. VAN ALPHEN

J. C. Van Alphen & Zonen
Amsterdam, Netherlands

- Names of possible suppliers of this type of machinery are being forwarded.—Ed.

LOCKS FOR CHINA

Sir:

It would be appreciated if you will kindly send me a complete list of manufacturers of locks and accessories used for leather luggage, brief cases, etc., to enable me to establish business relationship with them. . . . I feel certain that there are a number of reputable manufacturers in the States who may be interested in doing business directly with China. . . .

F. UNGER

587/4 Seymour Rd.
Shanghai, China

- We have forwarded a list of trunk and suitcase hardware manufacturers.—Ed.

HIGH GRADE STEELS

Sir:

We would feel obliged to you if you would kindly give us a full list with complete address of the most important U. S. steel manufacturers having a high reputation in the line of high grade steels such as high

ARISTOLOY
STEELS

ALLOY TOOL

BEARING QUALITY

SPECIALTY

NITRALLOY

STAINLESS

CARBON TOOL

MAGNAFLUX-AIRCRAFT QUALITY

ARISTOLOY

QUALITY ELECTRIC FURNACE STEELS

**COPPERWELD
STEEL COMPANY**
WARREN, OHIO

NONE FINER

This is the truck to take loads off your mind

Always Room UPSTAIRS

Plenty of it . . . when you use the Crescent *Electric* Palletier. It multiplies storage capacity in warehouses that seem to be bursting at the seams. The Palletier transforms vertical space into useable space. Your loads are neatly stacked, tier on tier, high above the floor. Removed easily from storage, too.

The Palletier slashes your handling costs as it slices your handling time. One man lifts, transports, tiers and detiers. Compact, extremely maneuverable, the Crescent Palletier slips in and out of congested quarters with ease. It has plenty of power to climb ramps . . . speed loading and unloading of common carriers . . . is available in 1, 2, 3, 4, and 6,000-pound capacities. Free bulletins sent on request.

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- **Full Magnetic Contactor Control** protects against forced acceleration — extends life of motor and tires.
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Crescent ELECTRIC PALLETIER
REG. U. S. PAT. OFF.

speed steels, tool steels, alloyed a nonalloyed, structural steels, stainle steels and heat resisting steels, e

ROBERT ZAPP
Dusseldorf, Germany

● Lists have been mailed.—Ed.

CENTRIFUGAL CASTING

Sir:

If copies of J. D. Nisbet's article o centrifugal casting, which appeare in the June 19 issue are available would appreciate a copy.

W. B. HARTLEY
General Purchasing Agen
Perfect Circle Corp.
Hagerstown, Ind.

● Tear sheets of "Producing High Purit Metals With Vacuum" are being sent.—E

METAL WINDOW SHADE

Sir:

In the Aug. 12 Newsfront there i a new product article referring to window shade cut and formed fron a solid metal sheet. We should appreciate information regarding the manufacturer of this material.

H. T. KENNEDY
Presiden
H. T. Kennedy Co.
New York

● Wart Bros., 1100 N. Cicero Ave., Chicago, is the manufacturer.—Ed.

MILLING MACHINE VISES

Sir:

Kindly advise the names of manufacturers of small milling machine screw vises with approximately the following specifications: Jaws, 5 in. wide, 1½ in. deep, 3⅛ in. max. opening; overall, 4 in. high; type, solid, not swivel.

W. C. EBERHARDT
Research Engineer
Gould & Eberhardt
Irvington, N. J.

REQUEST FROM U.S.S.R.

Sir:

Two articles, "Spectrographic Control of Converter Blow," by S. T. Jazwinski, in the May 29 issue, and "Basic Characteristics of Useful Industrial Laboratory Instruments," in the May 1 issue, would be welcome additions to my files. May I trouble you for tear sheets of these two items?

MYRON ACKLAND
Research Engineer
Ural Institut of Ferrous Metals
Sverdlovsk, U.S.S.R.

STEEL INGOTS

Sir:

I am interested in obtaining reprints of the series of articles beginning in the Oct. 9 issue entitled, "Solidification of Steel Ingots," by J. R. Fleche.

B. R. PRICE
Div. Staff Supervisor
Westinghouse Electric Corp.
East Pittsburgh

The
IRON AGE

Vol. 160, No. 23 December 4, 1947

THOMAS L. KANE
Publisher

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Production Manager

C. E. ELLIS
Promotion Manager

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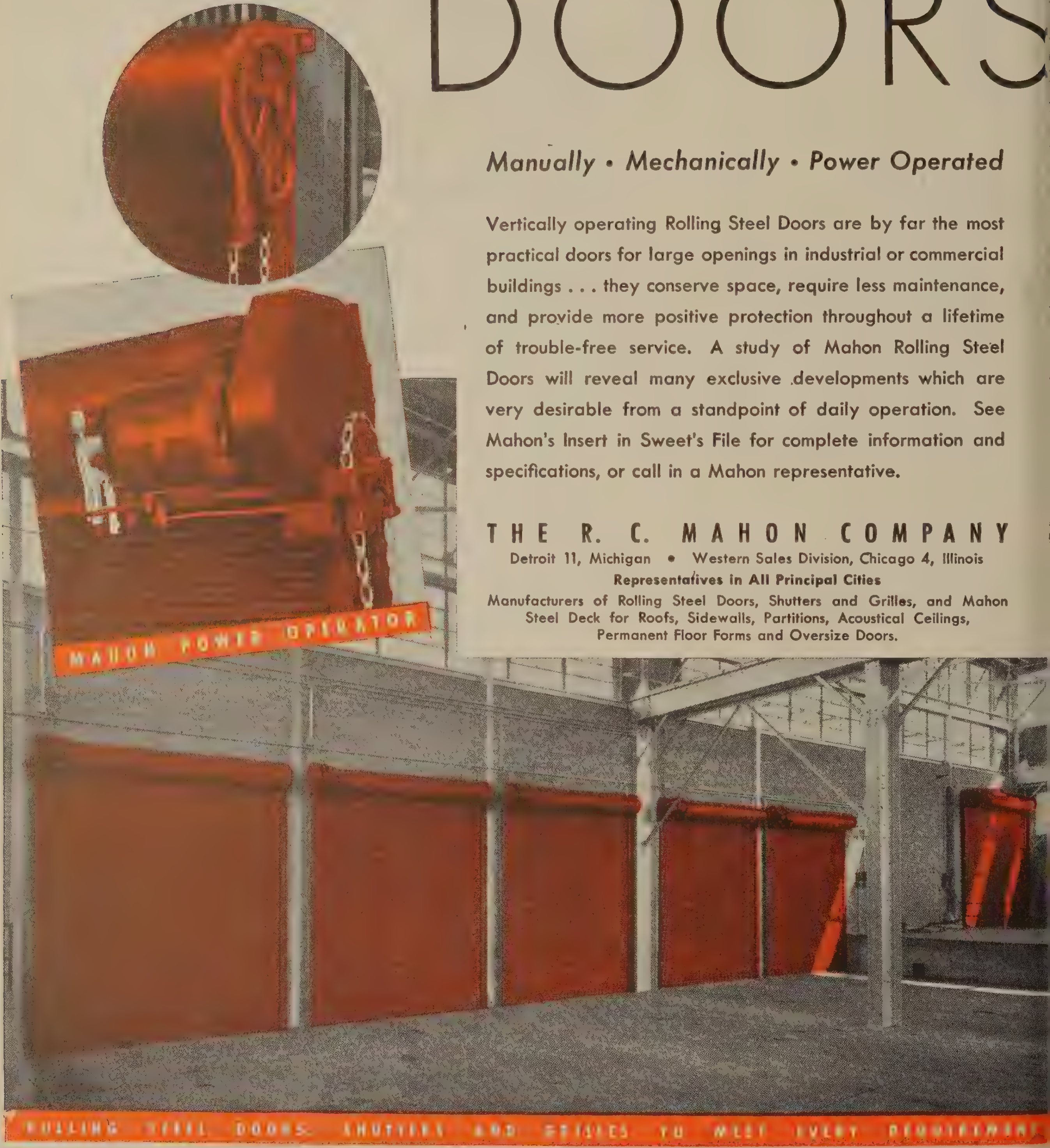
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A Liberal's Dilemma

TEN Hollywood luminaries have just been cited by Congress for contempt. These hundred-thousand-dollar-a-year victims of capitalist oppression have been asked a simple, direct question by Chairman Thomas of the House Un-American Activities Committee: "Are you a Communist?" Challenging the authority of the Committee and invoking their asserted rights under the American Constitution, these men refused to answer.

This defiance poses an embarrassing dilemma to all honest liberals. The founders took particular pains to define the meaning of personal liberty. It might be argued that all the rights specified and described in the Bill of Rights had already been acknowledged by implication in the body of the Constitution. To satisfy those who doubted the authority of inferential guarantees, the Bill of Rights was added.

Wherever Communists have seized power, they crushed completely and ruthlessly the freedoms which the Bill of Rights protects. With monstrous effrontery they here invoke a right which they are the first to deny when they become the masters of a community.

Is freedom of speech an absolute, unlimited right? Can it possibly be construed to include libel, defamation, incitement to violence and advocacy of revolution? On these questions the Courts have long since made their answer. Freedom of speech, like all other rights, must remain qualified. The qualifications must be defined by our tribunals and if this discretion contains a possible menace to our institutions, it is at least exercised in the open. If arbitrary or erroneous, it is at once exposed by public protest.

Legal casuistry, doctrinal bias and mistaken liberalism may claim special privilege for Communists on the ground that they are a political minority and that our tolerance of their activities is a valid test of democracy.

Plain citizens who reason by ear—this still describes the majority of Americans—have little trouble with this problem. It is folly to cooperate in your own extermination. Here is a fellow taking advantage of our rules of fair play to destroy us. The early fathers formulated our basic covenant to protect our institutions and preserve our liberties. They did not mean to garb the subversive action of the saboteur with the cloak of legality. Nowhere in the Constitution is there any provision for mandatory suicide. When the Communists claim the license to deliver us to a foreign despot, they argue that the early delegates in Philadelphia contemplated—and condoned—permissive treason.

In this controversy over fundamental rights, all the emphasis has been on the first Amendment, which denies Congress the right to pass any law "abridging the freedom of speech, . . . ; or the right of the people peaceably to assemble, . . . ". The discussion has ignored Section Three, Article Three: "Treason against the United States, shall consist . . . in levying war against them, or in adhering to their enemies, giving them aid and comfort . . . . The Congress shall have power to declare the punishment of treason, ..."

If this does not cover the bright boys from Hollywood, then the English language has lost all meaning.

Joseph Stagg Lawrence

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IRON AGE — NEWSFRONT

Dec. 2, 1947

► Estimates are that the New England states receive three loaded freight cars for every one shipped out. To correct the out of balance, New England is out shopping for a steel plant. Proximity to newly discovered Labrador ores and foreign ores are the current selling points.

► One New York state stamper estimates that his die costs have gone up 800 pct this year due to his inability to make continuous runs on any one setup. Despite the shortage of flat-rolled steel, many consumers continue to redesign for stampings in place of castings--a large agricultural machinery maker says he has designed 150 new stampings in the past 18 months, but not a single casting.

► The Opel plant in Reusselsheim, Germany, produced 350 trucks and 660 electric refrigerators during September. This was peak postwar production for both items.

► A Rhode Island manufacturer with dock facilities but not equipped for scrapping vessels is dickering with a scrap concern for the joint purchase of PT boats. The idea is to salvage 400 tons of desperately needed pipe the company has been unable to secure through regular gray market channels.

► The shortage of metals forced wartime Germany to resort to paper containers for motor oil. Drawn in the shape of a bottle, closed with a small metal cap, they were produced at a unit cost of 15 pfennigs. The inside of the container was sprayed with a special coating called mowalith.

► The clad metal market is taking on the outward appearance of a gravy train. Several large basic steel producers are investigating the field and two are already quietly selling clad steels on an experimental basis. One is in stainless clad plate; the other has reportedly sold stainless-copper-stainless sheet for less than $1 per lb for cooking utensil use.

► Unless current Washington proposals to trade foreign minerals for U. S. aid are surrounded with better safeguards than our wartime Chinese tungsten agreement --we may be left holding the bag. The Chinese government did not deliver too much tungsten on that account against a $100 million loan. But there is a constant business in "smuggled" Chinese tungsten.

► A steel company for small shapes, wire rods, and nails will be built in Ceylon with an estimated production of 7500 tons per year. The island's annual consumption is estimated at 30,000 tons.

► While the public clamors for more comfort in commuter and passenger trains, the passenger car orders are being shoved farther behind by the freight car program. Labor and materials are being concentrated there, while the passenger cars are sandwiched in where possible.

► Many steel companies were keeping their expansion plans under their hat last spring for competitive reasons, but are now being driven out in the open by the pressure in Washington for more steel capacity. Now the steel industry brass is squirming because last spring's statements are being hurled back at them.

► With all the talk about higher steel prices reports from the field fail to disclose any serious complaints over regular steel mill base prices. The real grumbling is on gray market levels, and on conversion deals. The final gross costs on the latter often work out at about the same level as flat gray market quotations.

► A new rubber belt that will not slip has been introduced--said to be highly flexible and noiseless in operation--and has great strength. The new belts are used with special pulleys grooved to fit the teeth. Reinforcements are available in steel cables embedded in oil-resisting synthetic rubber.

► The Reconstruction Finance Corp. is quietly undertaking a study of its own on steelmaking capacity. Realizing that some groups feel that the RFC should advance money for expansion, the agency wants to be prepared to talk about it. Senator Murray is preparing a bill to be introduced in January calling for a government capacity study and subsequent government construction if the study shows a need for it.

Unusual Tooling Expedites

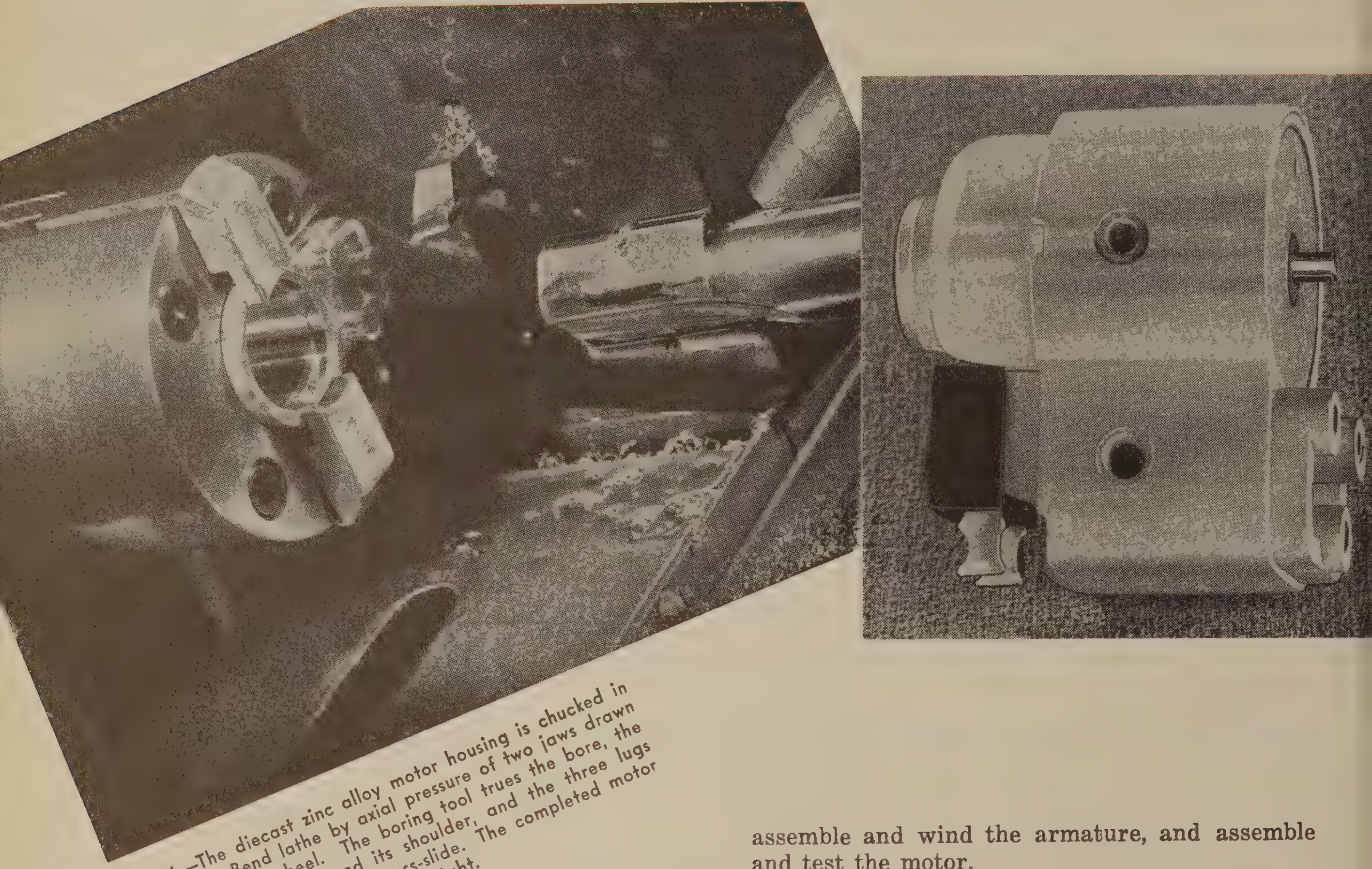


FIG. 1—The diecast zinc alloy motor housing is chucked in this South Bend lathe by axial pressure of two jaws drawn back by a hand wheel. The boring tool trues the bore, the stepped bearing seat and its shoulder, and the three lugs are faced by a tool in the cross-slide. The completed motor is shown at right.

IN planning the production and assembly of a new 0.0005 hp electric motor, ways were sought to do the job at minimum cost with only a few employees, yet without sacrificing the high precision demanded to fulfill exacting performance requirements. Some of the unusual techniques employed are described for the first time.

This small motor, designed for clock-winding but applicable to other jobs, weighs a little more than 3 oz and occupies less than 2 cu in. Since it must operate from a 1½-v hearing-aid battery of still smaller size, the power consumed has to be minimized. Any excessive friction would reduce output, which is only 0.0005 hp.

Partly to avoid buying equipment that would not be kept busy, all stamped parts are purchased, as are the molded brush holders, the serrated drill-rod shafts, the commutators, both porous bronze bearings, and the diecast zinc alloy housings. The latter contains an Alnico magnet and two steel poleshoes cast in place as inserts, thereby simplifying assembly problems. The job at this plant is to machine this housing, assemble and wind the armature, and assemble and test the motor.

Machining is simplified because the diecasting dimensions are held within close limits. The few cuts required are light and rapidly made. All machining on the housing, except the drilling and tapping of four small holes and the spinning and staking at assembly, is done in the two setups shown in figs. 1 and 2.

In the first of these operations, performed on a small South Bend lathe, the housing is chucked and held by two end clamps to avoid radial pressure that might distort the bore. A carbide tipped tool, fixed in the tail-stock, sizes the 0.7755 to 0.777-in. bore and the 0.8110 to 0.8115-in. bearing step and shoulder. Then a tool in the cross-slide faces off the ends of the three mounting lugs. This insures a mounting face precisely at right angles to the bore. This setup readily handles 36 pieces an hr.

As the bearing bore on the opposite end involves a step and shoulder, it must be machined from that end and still be held truly concentric with the bores made in the setup in fig. 1. This is accomplished in the drill press setup shown in fig. 2, which has three plugs on a slide fitted between ways fastened to the bed. These plugs have, from front to back, the following diameters: 0.7755, 0.7760 and 0.7765 in., and the operator must see that the plug that fits the bore without any play is used.

If the piece goes over the largest plug and has

Midget Electric Motor Output

* * *

By F. R. SCHULZ
President,
Essell Corp.,
Newark, N. J.

* * *

Use of diecastings and unusual production techniques for the production of miniature electric motors of 0.0005 hp are described in this article. Weighing about 3 oz and operating on 1½ v, the production methods require that precision be combined with ingenious methods for handling the very small parts involved. In addition to covering machining operations, the author describes an unusual setup for winding the extremely small coils on the armature.

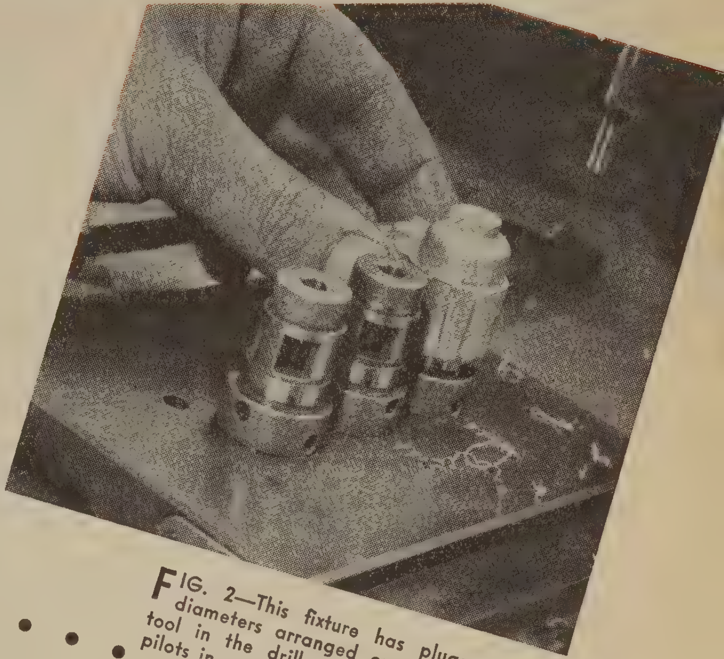


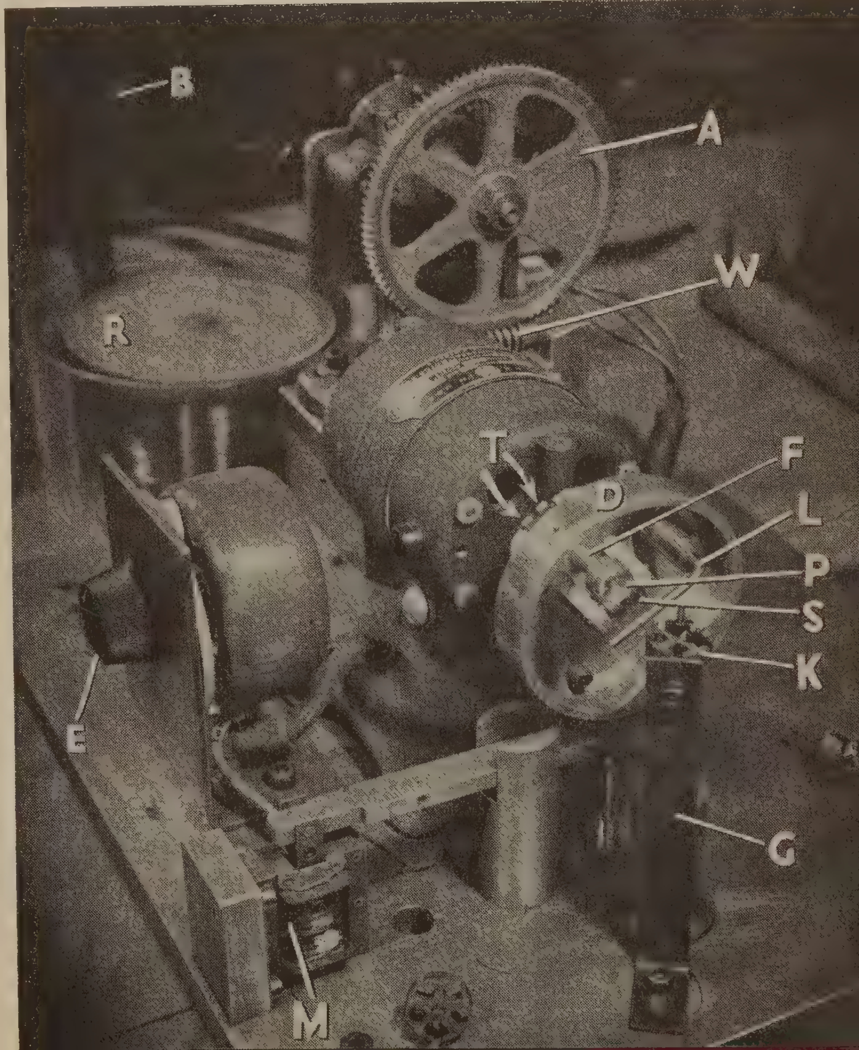
FIG. 2—This fixture has plugs of three diameters arranged on a slide under a tool in the drill press spindle. This tool pilots in one plug hole while a bearing seat is sized and its shoulder is trued.

any play, its bore is too large and the piece is scrapped. If the piece will not go over the smallest plug, the bore is too small and must be resized. Thus, in effect, the fixture acts also as a plug gage and rejects parts not correctly sized.

Each plug has at its center a hole that fits a pilot on the cutting tool in the drill chuck. This insures that the cuts producing the bore and shoulder face for the bearing are concentric and square, respectively, with the bores previously finished. The carbide-tipped tool holds the bore between 0.3750 and 0.3755-in. limits and 213 pieces an hour are produced in this setup. The four screw holes in the castings are drilled in a conventional box fixture and tapped in a drill press equipped with an automatically reversing chuck. This completes all cutting operations, leaving the housing ready for assembly.

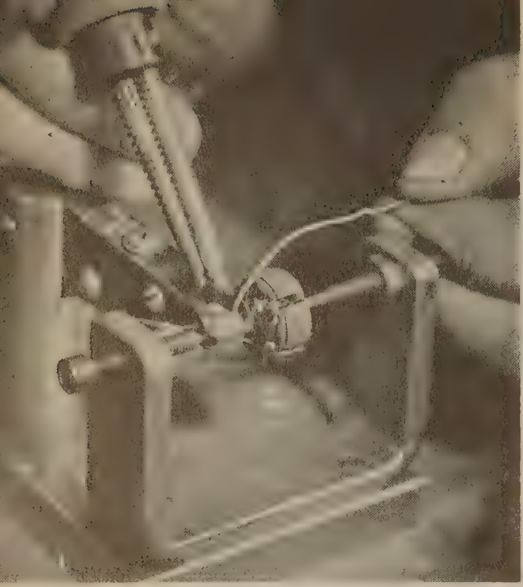
The armature winding fixture, fig. 3, does a precision winding job at high speed. The armature to be wound is positioned vertically in a V-shaped lug in fixture *G* (fig. 3). It is supported by a spring resting in one of the five lamination slots. Each coil is wound in alternate slots, in a plane at right angles to the axis of drum, *D*, but parallel to the axis of the armature shaft.

No. 33 copper wire insulated with Formvar is drawn from a plastic cylinder on a



RIGHT

FIG. 3—The special machine is employed for winding coils on the small armature. An unwound armature is shown in the foreground and, as wound, at extreme right. The armature being wound is at position K.

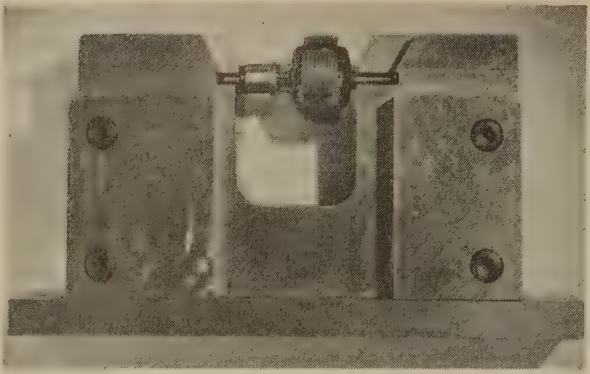


ABOVE

FIG. 4—Each armature is placed in this fixture, while leads from windings are soldered in slots, one of which is cut at the inner end of each commutator segment. Heat is applied by high-frequency current entering by a carbon electrode which is placed in contact with the grounded commutator segment to be soldered.

BELOW

FIG. 5—This gage has slots that fit the journals of the armature shaft and check the shaft for straightness. If the shaft is bowed, this is revealed by light along the shaft as the armature is spun.



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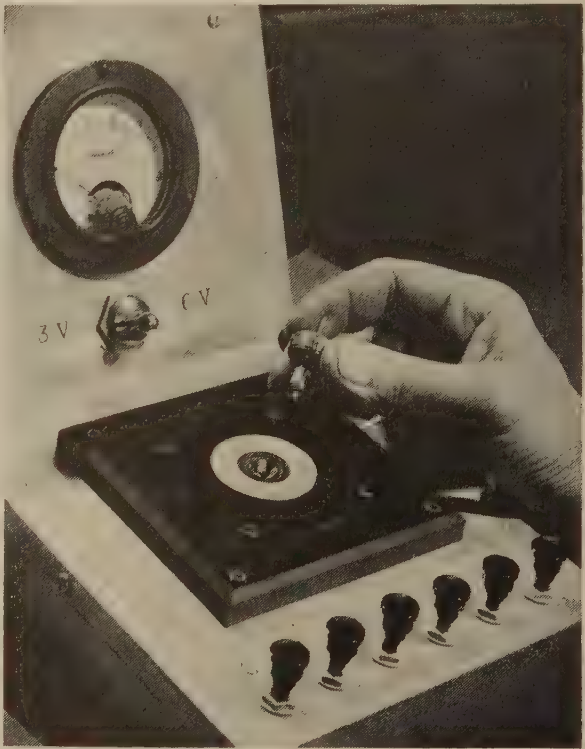
BELOW

FIG. 6—Armatures are rapidly tested electrically in this test instrument for shorts, grounds and open circuits after the five commutator segments are placed in contact with the prongs at center.



reel, *R*, at the back of the winding machine, through a felt bob that tensions the wire. Passing from the bob through the hollow shaft of the motor, the wire feeds through the back of the drum, *D*, over a set of small sheaves, *S*; returning through the back of the drum and over sheaves *T* into the hollow pin, *F*. This pin, parallel to the motor shaft, is eccentric to it by 1 in. A knob in the center of the hollow pin carries a sapphire, *P*, in the center of which is a hole through which the wire feeds to the armature, *K*, being wound.

The hole through the sapphire flares out into a cone over the inner face of which the wire feeds as it is wound onto the armature. A sapphire is used because it is smooth and hard enough to resist the cutting action of the Formvar insulation, which is quite abrasive. Bent rod, *L*, which is hardened and at right angles to the axis of rotation of the drum, serves as a guide for the wire feeding to the armature, both positioning it and keeping it at proper tension.

The winding operation is controlled by a microswitch immediately behind the 96-tooth worm wheel, *A*. This worm wheel is driven by a worm, *W*, through a pair of bevel gears on the back end of the motor shaft. Two diametrically opposed pins on the back of the worm wheel trip the microswitch which breaks the current to the motor after 48 motor revolutions or a half turn of the 96-tooth gear. When this occurs, the solenoid, *M*, operates a brake on the rim of the winding drum stopping the winding action.

This arrangement gives the armature one turn for each turn of the motor and one twist for each coil turn. The twist helps make the wire hug the walls of the slots in which it is wound. Knob *E* controls a rheostat, through which the motor speed and winding speed can be varied, depending upon the size of motor being wound and the size of wire used in the winding.

As soon as one coil is wound, the operator twists the leads, cuts the wire, indexes the armature one slot and begins winding a new coil after starting the wire into the proper slots. So rapid is the winding that 42 armatures, each having five coils of 48 turns each, are completed in an hour. Two of these machines can keep step with present production requirements but a third machine is kept available.

After winding, the coils are impregnated and backed, a Bakelite commutator is pressed onto the shaft, and each pair of leads is soldered to its respective commutator bar. Soldering is accomplished in the fixture shown in fig. 4. The commutator is supported on a pair of screws under a pair of crescent shaped clips pressed downward by a spring. These clips hold the pair of wires in place as each wire rests in a short slot, one of which is cut at the center of the inner end of each commutator segment. One clip is grounded, thus grounding the segment that it touches.

Soldering is facilitated by use of a Luma electronic soldering device, designed to heat a short length of any metal placed between two small carbon electrodes in tubular supports fitted into a cork handle. As shown in fig. 4, only one electrode is used, the other holder being grounded and held in contact with the grounded prong resting on the commutator segment to be soldered. When the ungrounded carbon electrode is pressed on this segment, the latter is heated and a drop of flux-cored solder is melted into the slot in which the wires rest, making the soldered joint.

With this arrangement, one operator can solder the five segments of each commutator at the rate of about 31 an hr. Leads projecting beyond the soldered joints are cut off. The commutator is finally turned to size in a jeweler's lathe and is then polished, leaving the armature complete and ready for inspection and assembly into the motor frame.

The armature shaft, previously checked for size, is checked for straightness. This is done in a gage, fig. 5, containing two slots, the walls of which are straight and spaced 0.0942 in. apart. Shaft journals are held to within 0.0937 and 0.0940-in. limits on diameter. If shafts are not straight, journals either will not slip into the slots or, if they go in and are straight, will show a straight line of light at one side of the shaft when the armature is given a spin. Any failure to meet this test has to be corrected by straightening the shaft. This usually can be done with finger pressure.

Electrical inspection of armatures is performed in the fixture, shown in fig. 6, which has in the center five prongs between which the commutator is slipped and set so that one prong bears on each segment. Low voltage dc is applied and as the keys in foreground are pressed in succession, the ammeter shows whether there is a ground, short or open circuit in any coil. If there is a ground, it is revealed when the first button is pressed. On the other five buttons, no reading indicates an open circuit and a high reading indicates a short. Keys are operated rapidly with the fingers of one hand and the inspection time per piece is short.

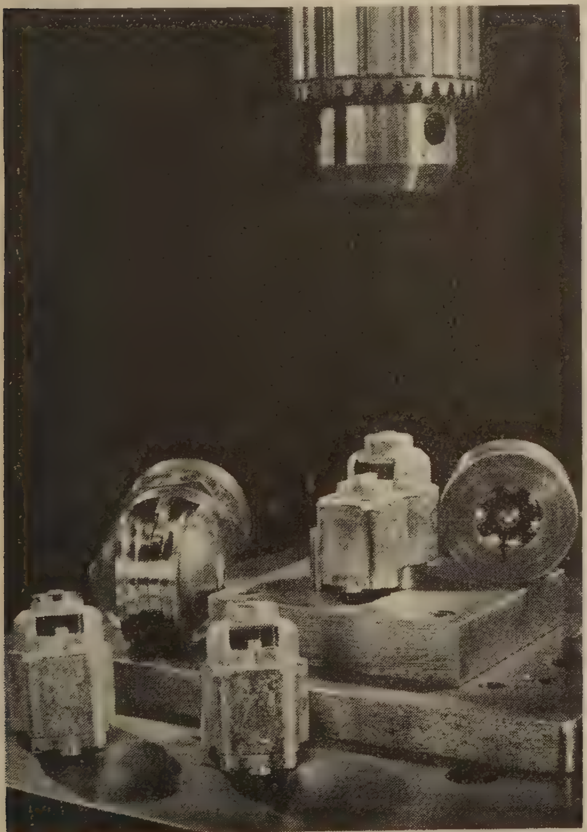
Before the inspected armature is put into the motor housing, the bearing nearest to the commutator is put into place below a felt washer and a cap; the latter fitting a stepped recess inside a lip that is spun over to seal the cap in place. The cap is a small circular stamping with a hole in its center. To make sure that spinning is properly done, it is started with a tool, shown at the right in fig. 7, which has a series of bearing balls at the correct diameter.

This tool has a shank to fit a drill press chuck and a central pin which pilots in the cap hole to make sure that spinning is concentric. Concentricity of the housing in reference to the tool is insured by mounting the housing on a plug of a fixture fastened to the drill press bed. The vertical axis of the plug is in line with the chuck axis.

Application of the ball spinning tool leaves a concave radius where the balls bear. As a convex rounded corner is wanted, the conventional spinning tool, using tilted rollers, is applied in

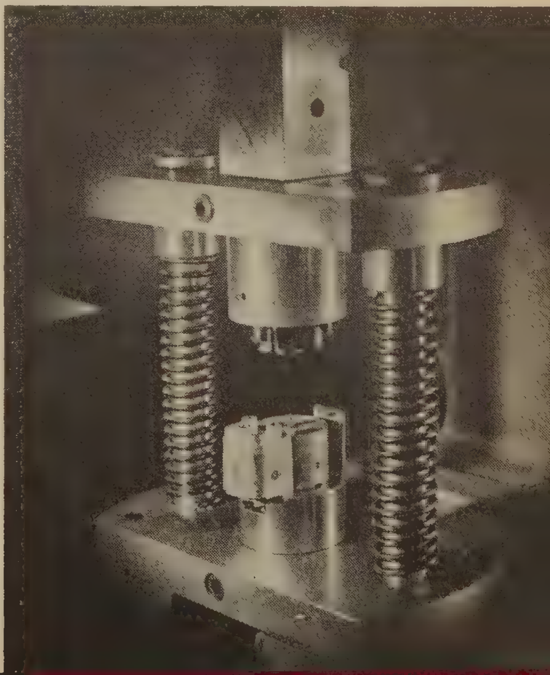
(CONTINUED ON PAGE 140)

FIG. 7—The tools in this fixture are used for spinning over a lip of the diecast housing at the end of one bearing recess. The tool at right does the initial spinning and it is finished by the roller tool, at left, which produces a convex edge.



RIGHT

FIG. 8—This arbor press setup stakes the front bearing cap in place. A hole in the center of the pin of the tool pilots over the projecting motor shaft.



Electromagnetic Pumping Of Molten Metals

A new, nonmechanical method for pumping molten metals of high melting point is described in this article. Eliminating the need for tilting equipment, the electromagnetic method of pumping, in conjunction with the induction melting furnace, appears to offer new and improved techniques for permanent mold and diecasting operations. Flow is controlled by variations of induced current, while volume of metal pumped—at constant temperature—is determined by duration and rate of discharge.

By MARIO TAMA
Research Engineer,
Ajax Engineering Corp.,
Trenton, N. J.

FOUNDRIES are always confronted with, and must solve in one way or another, the problems of handling molten metal, especially of transferring it from the furnaces to the molds. Although mechanical pumps have been applied, their use is fraught with difficulties that increase rapidly as melting temperatures increase. In consequence, the common practice, especially for small castings, is to employ ladling with or without mechanical equipment for handling or tilting the ladle. Only recently have the possibilities of nonmechanical—electromagnetic pumping—been investigated and made ready for commercial use. This development, fig. 1, is based on exploitation of the electromagnetic forces created by a heavy electric current flowing through a molten metal conductor of restricted cross-section.

At all times since the induction principle has been applied to the melting of metals, violent movements of the liquid metal have been observed. These movements are present in all types of induction furnaces — high and low frequency, coreless and core type, and open ring and submerged resistor. Many theories have been postulated to explain the cause and nature of this motion but no unanimity has been reached between the different investigators, because the measurement of velocities or pressures of liquid metals at high temperatures is connected with almost insurmountable difficulties. It is no easy task to evaluate or measure the magnetic fields surrounding the melting channels of induction furnaces.

Very elaborate research was carried out in Germany around 1928 in the course of a patent litigation involving the movement of liquid metals within the melting channels of submerged

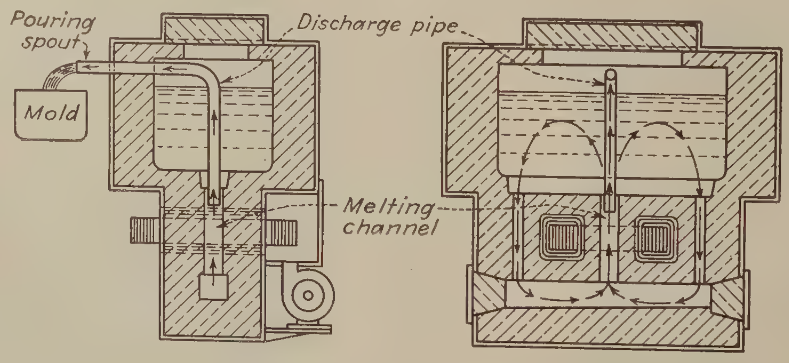


FIG. 1—Two principal cross-sections of electromagnetic pumping unit, showing the discharge pipe, the restricted melting channel where pressure is created, the pouring spout, and the mold.

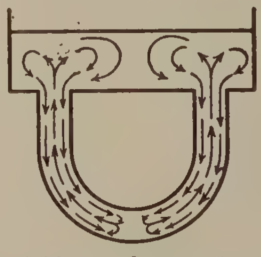


FIG. 2 — Cross-section through the secondary circuit of a submerged resistor-type induction furnace. The arrows show the conventional flow direction of the metal.

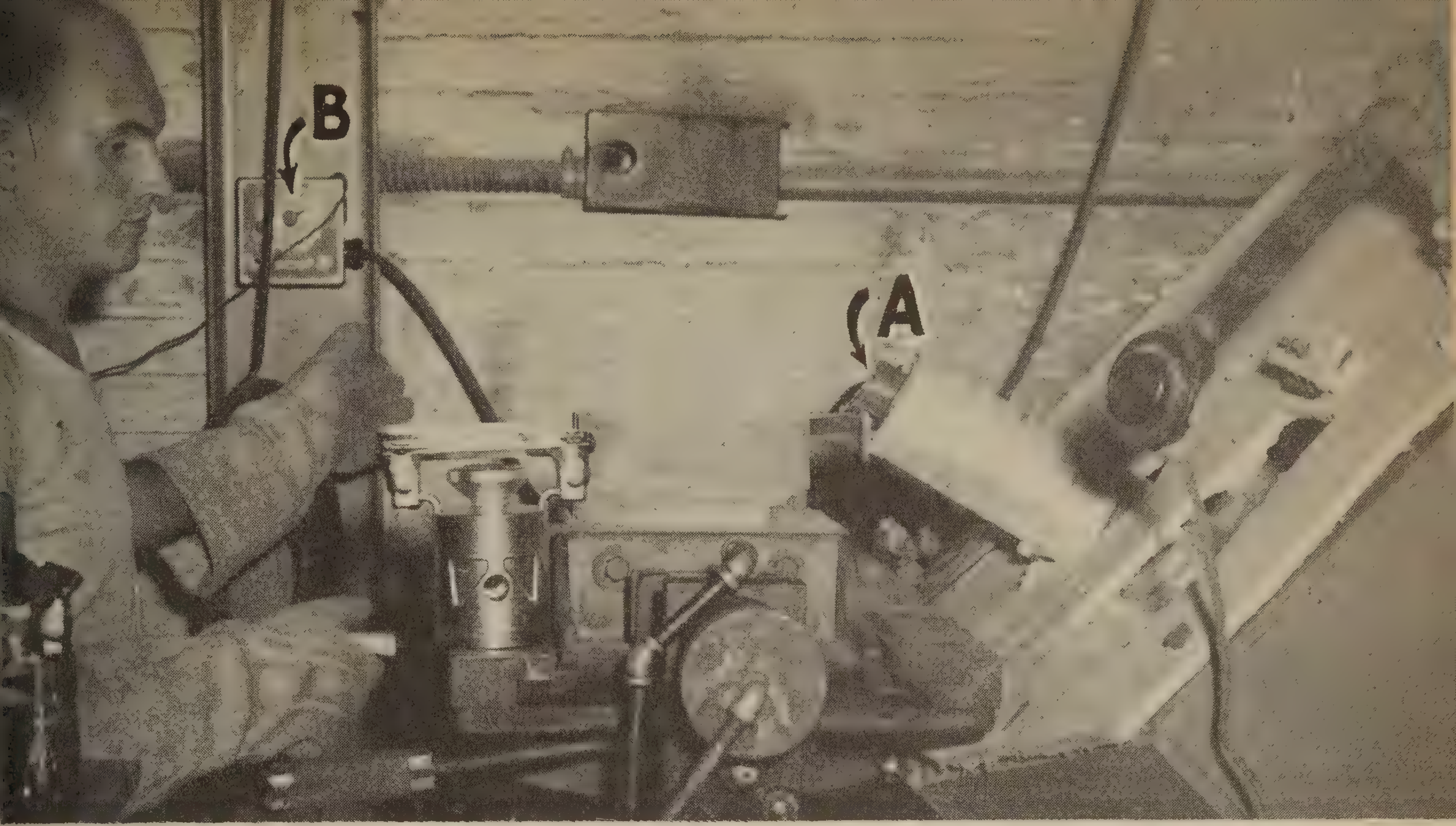


FIG. 3—Electromagnetic pump showing casting of pistons in a permanent mold; A is the pouring spout, and B the time switch used to start and stop the flow of metal.

resistor induction furnaces. Riepe and Ilberg[1] made a valuable contribution to the art by measuring the velocities of liquid metals at different points of the melting channel with a Pitot-tube. Their experiments proved conclusively that in the secondary channels of submerged resistor induction furnaces the metal movement is as shown by the arrows in fig. 2. The metal is forced out of the channels at the center of their cross-section and attracted into the channels at the periphery. An outward and inward movement of the metal was thus proved to be present at the points where the melting channels open into the hearth and inside of the channels.

Work conducted at Ajax Engineering Corp. has been concentrated on utilizing these electromagnetic pressures for pumping molten metals at high temperatures. Thus far the investigation has been limited to aluminum and its alloys, but the same principle can be applied to heavier metals.

The realization of a practically reliable and efficient pumping method for metals of high melting point opens a variety of new and useful fields, as, for instance: Discharging molten metal from a stationary melting furnace, thus eliminating the need for tilting equipment; stirring the metal in a reverberatory furnace; siphoning metals from one container to another; starting a siphon for molten metals; tapping or spigoting molten metal from a furnace to permanent molds or die-casting molds, etc.

Principles of Pumping Action

The electromagnetic method of pumping is made possible based on the premise that when an electric current is forced to pass through a conductor—molten or solid—it creates a magnetic field within the conductor and outside of it. Only the field within the conductor provides forces beneficial for imparting motion to the metal contained therein. The shape of the magnetic field is substantially the same when direct current or alternating current is used. By the combined effect of the current elements flowing through the conductor and the magnetic field elements cutting through the current elements, internal forces are created within the conductor. If the conductor is a molten metal, electromagnetic pressure gradients are established within the conductor with zones of high pressure at certain places and zones of low pressure at other places. The forces are directed towards the center of the magnetic field and the direction of the forces can be determined by the well-known "three-finger rule." If alternating current is used, the direction of the forces is not changed when the current is reversed. Therefore, the pressure gradients created within the molten metal are always maintained in a definite direction during the entire process.

The physical laws governing the pressures and forces in liquid electric conductors subjected to a heavy current passage were formulated in 1907 by E. F. Northrup,[2] who applied to these phenomena the name "pinch-effect," a term which was thereafter adopted in all languages. In the course of his theoretical investigations he produced a fountain of mercury operated by direct current.

In the electromagnetic pumping device, see fig. 1, alternating current is used because it allows the concentration of large energies in small space. A refractory pipe is inserted into a section of the secondary circuit of an induction furnace where a high pressure is created by the secondary current. The other end of the pipe leads to the outside of the furnace and serves as a pouring spout or nozzle capable of transferring molten metal to the mold.

This simple arrangement transforms the disorderly metal movement represented in fig. 2 into a coordinated unidirectional flow, as indicated by the arrows in fig. 1. It is paradoxical because the metal moves contrary to the forces prevailing in the current-carrying tubes. According to the three-finger rule, the forces and pressures created by the current within the secondary circuit are perpendicular to the direction of the current. With the electromagnetic device a movement is obtained in the direction of the current, which means that the metal flows in a direction vertical to the forces. This surprising effect is similar to what one would experience if he dropped an apple and it would fly away from his hands, sidewise, towards the horizon.

Another advantage of the pumping device is that the same equipment can be used for holding metal at a desired temperature (holding furnace) and for casting (pumping unit).

Fig. 3 shows an arrangement for casting automotive pistons in permanent molds. The pumping and holding unit is of the twin coil type and has been recently described.[3] The resistor channels are placed in an inclined position. The pouring spout *A*, fig. 3, is the straight prolongation of the center channels, and, in this respect, the arrangement differs from that described in fig. 1. The spout is made partly of graphite and partly of silicon carbide and has a resistance heater on the part located above the metal level to prevent freezing of the outpouring metal.

The pump has three separate control circuits, two for holding and controlling temperature and the third for pumping. The latter is released in this particular case by a push button control *B*, fig. 3, connected with a time switch. Pumping current is applied only for a short time. The cross-section of the pipe and nozzle is so dimensioned that a certain amount of metal is discharged from the furnace during a definite predetermined period of time. In permanent mold and diecasting operations it is not sufficient to repeatedly pour the same weight of metal; the time element is a decisive factor and this is the most important feature of the new electromagnetic device.

Obviously, the metal is taken from the bottom of the furnace and the slags of the bath surface are by-passed and not poured into the molds. In hand ladling, the possibility of carrying slag particles into the molds is one of the most serious handicaps.

This new method of pumping metals at high temperatures opens new horizons for the foundry technique. The electric current which is used as prime mover can be started and stopped at will, utilizing mechanical or electrical means, such as time switches, limit switches, electric eyes, etc. The current intensity can be regulated to conform exactly with the desired pouring rate. The molds can either be arranged in a turntable or merry-go-round in front of the electric pump, or the molds can be arranged in a circle and the pump rotated to discharge metal at any desired rate. In all these applications, the high sensitiveness of electrical apparatus can be fully maintained.

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[1] *M. Riepe and H. Ilberg, "Flow of Molten Metals in Electric Furnace," Forschungshefte (German) vol. 2, p.* 413.

[2] *E. F. Northrup, Physical Review,* 1907, *p.* 474.

[3] *M. Tama, "Melting Aluminum Scrap in the Low Frequency Induction Furnace,"* THE IRON AGE, *Sept.* 4, 1947, *p.* 76.

Tungsten Alloy Electrodeposition

TUNGSTEN alloy deposits which retain hardness at elevated temperatures on metal surfaces have been produced by a method of electrodeposition recently reported by the National Bureau of Standards. With this method it is stated that smooth, thick deposits of tungsten alloyed with cobalt, nickel, or iron have been successfully obtained from hot ammoniacal solutions containing organic acids.

Of the alloys investigated, cobalt-tungsten was found to deposit most easily. A typical solution used for depositing cobalt-tungsten contained: Tungsten, 25 g per liter (as sodium tungstate); cobalt, 25 g per liter (as cobalt chloride or sulfate); Rochelle salt, 400 g per liter; ammonium chloride, 50 g per liter; ammonia to a pH of 8.5 to 9. Plating takes place at a temperature above 195°F and at a current density of from 2 to 5 amp per sq dm. The Rochelle salt may be replaced by salts of other organic hydroxy acids. As anodes, either tungsten, the appropriate iron-group metal, or a tungsten alloy may be employed. Tungsten anodes leave the least amount of residue when they go into solution, the Bureau reported, and may be used without bags. The nickel-tungsten and cobalt-tungsten deposits have good adhesion to steel and can be plated up to a thickness of 0.02 in. without becoming appreciably nodular, it was stated. The most interesting feature of the alloys obtained by this process was said to be hardness, which in the untreated nickel and cobalt-tungsten alloys may be between 400 and 700 on the Vickers scale. The iron alloy was said to be still harder, ranging from 700 to 900 Vickers, and thus comparable in hardness to electrodeposited chromium. Unlike most other electrodeposits which soften with heat treatment, it was stated these alloys may increase 100 points or more in hardness upon heating to 1110°F. These coatings are said to be more readily applied to irregular-shaped surfaces than chromium plate, and it is expected they will find application on surfaces that require hardness and durability at elevated temperatures.

Effect of Alloy Composition On Surface Quality of Diecastings

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Maintaining the composition of zinc base diecasting alloys to very narrow limits of variation insures optimum castability characteristics and tends to minimize the surface defects and irregularities due to die design. This article explains the value of close composition control by citing the influence of variations of the various elements on castability of the alloy. The author describes fluidity and solidification range tests used at GM as shop control devices.

WHEN diecasting dies are not correctly designed, it is often necessary to hold the casting alloy closely to the composition of best castability in order to produce parts with a satisfactory quality of surface. In such dies there is very little leeway for variation of alloy composition and a burden of extra close control is placed on the materials and process of alloying the metal as well as on the casting technique and the maintenance and functioning of the machine.

Most well designed dies will produce satisfactory castings consistently even though the composition of the alloy may vary to the extremes of the specification limits. But too often, either because of the shape of the cavity or the arrangement and design of the gates, runners and overflows, dies are extremely critical and will produce good castings only when all other factors of the casting process are in perfect order.

Experience with such so-called "critical" dies shows that variation of metal composition, even within the limits of the alloy specification, can have an effect on the surface quality of the castings produced.

The composition for best castability of the type 5 alloy (ASTM XXV) is indicated to be with the following limits:

Aluminum	3.9 to 4.3 pct
Copper	1.0 to 1.25 pct
Magnesium	0.03 to 0.04 pct
Lead + cadmium + tin	less than 0.003 pct
Iron	less than 0.05 pct

Metal control adequate to guarantee so small a variation is expensive in equipment and time, but the alloying department can aim for such composition and will, with average control, be able to maintain it a good percentage of the time.

When the alloy is held reasonably close to the nominal composition indicated above, the solidification curve (see fig. 1) will show that there are no crystals freezing out above 740°F. In other words, the alloy remains completely molten at least down to this temperature. The shape of the curve is affected by the aluminum content and, to a lesser degree, by the contaminating elements in solution. When contaminating elements are not soluble in the melt to begin with, they do not affect the solidification curve, but do influence the rate at which the molten metal flows through an orifice. These two properties suggest means of checking the alloy in the shop and are used as a shop control at the Fisher Body-Ternstedt Div. These tests outlined in detail in tables I and II, must be supplemented by frequent spectrographic analyses to know the amounts of minor impurities present, which information is necessary for proper blending.

Present SAE and ASTM specifications for zinc alloys should be accepted as defining a quality alloy. The diecaster should acknowledge that, when the alloying department must work to closer tolerances, it is, in most cases, helping him to get along with inferior dies, machines or casting techniques. When the alloy is off specification, certain casting difficulties and surface defects

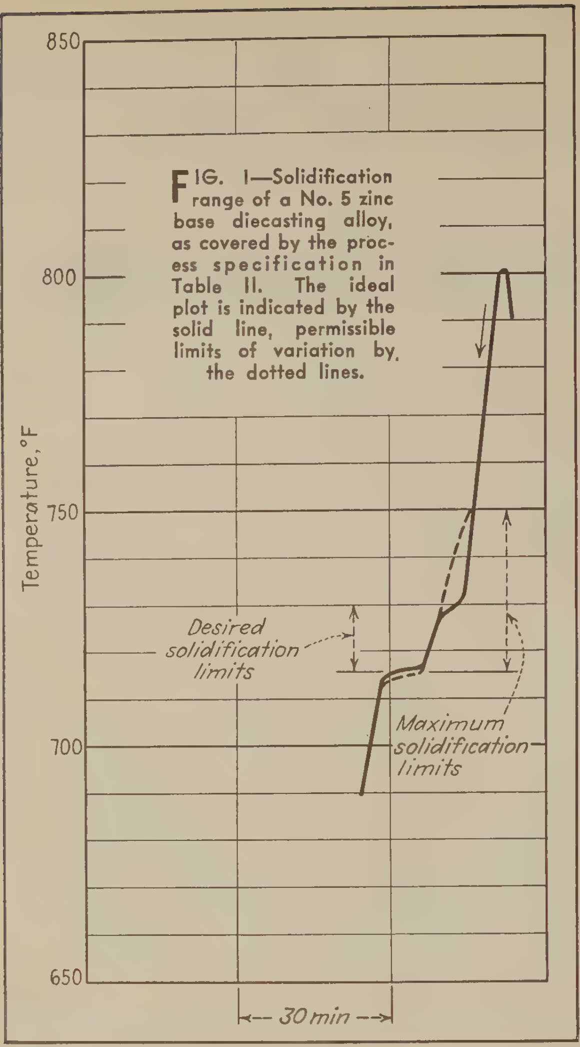


FIG. 1—Solidification range of a No. 5 zinc base diecasting alloy, as covered by the process specification in Table II. The ideal plot is indicated by the solid line, permissible limits of variation by the dotted lines.

will be evidenced. Listed below are the major elements which, when outside of the limits of the specification, are most liable to be a source of casting difficulty.

Aluminum—All generally used zinc base diecasting alloys contain about 4 pct Al. Besides contributing to the physical properties of the alloy and protecting it against undue iron pickup, aluminum is probably the most important single element contributing to castability. As aluminum content drops below 4 pct difficulty increases in casting parts free of chills, cold laps and swirls. This is hardly noticeable at quantities slightly below 4 pct, but becomes quite prominent at 3.5 pct and lower. At 3 pct there is a tendency toward sink-spots in castings which have large differences in cross-section and raising the copper content, in an attempt to harden the alloy, will not relieve this condition. The lower aluminum is below the eutectic (about 5.0 pct), the higher is the temperature at which solidification of the alloy begins. This higher freezing temperature cannot be efficiently compensated for by higher casting and die temperatures because of the limitations on die tolerances and the increase in shrinkage. Such a remedy would cause excessive flashing of the die and sink-spots Aluminum higher than 4.5 pct begins to contribute to brittleness of the cold casting and hot-shortness, causing castings to break off in the die. This tendency reaches a maximum at about 5 pct Al. Aluminum not only serves to protect the alloy aaginst iron-pickup, but also helps to rid the alloy of iron by floating off iron in the melt as an iron-aluminum compound which can be skimmed off. Thus, aluminum is lost to some extent in remelting. In regular operation, it will be found necessary to add extra aluminum to the

TABLE I

Fluidity Test for Zinc Base Diecasting Alloy

(Zamak No. 5 or similar)

Specification: A minimum of 20 oz of metal shall flow through the orifice in 5 min, under the test conditions established by this process specification.

Steps in making test	Detail
1. Heat test bowl	*Heat fluidity test bowl, and maintain at 800°F, ±5°F during test.* Comment: The bowl should preferably have a capacity in the neighborhood of 10 lb of metal in order to maintain the head of metal substantially constant during the test, and should have a depth of at least 5½ in. The bottom is threaded to receive a ¾-in. or 1-in. pipe plug through which a hole is drilled and reamed 0.030 ±0.001 in. diam and approximately 1 in. long, to form an orifice. This hole should be cleared before each test by insertion of a piano wire no smaller than 0.028-in. diam. Any indication of wear in the hole, during this operation, requires replacement of the plug. The bowl is inserted into a recess in the top of a small gas-fired brick oven having an automatic recording and controlling potentiometer to hold the temperature within the required limits.
2. Ladle sample	*Ladle sample of metal to be tested (at 800°F, ±10°) to fill fluidity bowl to a depth of approximately 5¼ in.* Comment: In the melting pot, a temperature range of ±10°F is permissible. The small size of the test setup permits closer control, enhancing the accuracy of the test results.
3. Preflow	*Allow flow to start through orifice, and discard.* Comment: This flow, into a small hand ladle below the orifice, is of only a few seconds duration, its purpose being to permit a starting point under full head of metal. If the metal is sluggish, the flow through the orifice can usually be started by jarring the bowl with a mallet.
4. Test flow	*Allow metal to flow through orifice into test ladle for 5 min.* Comment: Substitute for the ladle used to catch the preflow an empty hand ladle of about 2½-lb capacity, noting the time at which the metal from the orifice starts to flow into the test ladle. After 5 min have elapsed, withdraw ladle, and set aside the metal in the test bowl for later reclamation.
5. Quench	*Plunge test ladle with metal into water.* Coment: Purpose of quenching is to facilitate handling of the metal sample.
6. Weigh	*Weigh sample removed from ladle, and record weight in ounces as "fluidity."*

Note: Metal contaminated by oxides or other nonmetallic impurities, or by suspended insoluble metallics, will be hindered in its flow through the orifice, thus giving a relative measure of the cleanliness of the melt. If the "fluidity" value falls below the specified 20 oz, the melt should be refluxed and cleaned until a satisfactory test result is obtained, before releasing it to the diecast machines.

remelt pots. The quantity of addition is difficult to standardize because the quantity lost depends on the amount of iron-pickup and the condition of the scrap remelted.

Copper—The copper content varies from 0 to 3.5 pct in standard casting alloys. It contributes to corrosion resistance but, at the same time, makes the alloy less stable, both as to dimensions and as to mechanical properties. Copper promotes somewhat better castability by making the alloy less subject to sink-spots. Some copper is usually essential for castings which have considerable differences in cross-section. Because of the greater hardness of the alloys containing copper, they are more easily machined and may trim more smoothly than the copper-free alloy.

Magnesium—This element is added to the alloy only in small quantities, primarily to protect it against intergranular corrosion caused by lead, tin and cadmium, but magnesium also has a pronounced effect on casting properties. It makes the alloy somewhat more sluggish to flow but, though this would seem a drawback, it is, in many ways, beneficial to castability. Being less fluid, the molten alloy is less liable to spraying and splashing in the die cavity. Increasing the magnesium to about 0.04 pct will often clear up such surface defects as "splashes" and "chills." With high magnesium, the die surface becomes quickly coated with a heat insulating film, and though the tendency of the casting to "chill" is reduced the die surface will have to be cleaned if the deposit becomes thick and uneven. Since spraying is reduced by addition of magnesium, there is also less trouble with soldering (metal fusing to the die surface) if the magnesium content is maintained within proper limits. As magnesium is increased above 0.05 pct, there is a greater tendency for the castings to show cold laps and swirls. Above 0.08 pct the alloy is hot short.

Oxides—If the molten alloy is unduly contaminated with metal oxides, the melt will be sluggish and have poor flow qualities. This contamination may be due to overheating or too much stirring. In extreme cases the castings

TABLE II

Determination of Solidification Range of Zinc Base Diecasting Alloy

(Zamak No. 5 or similar)

Application: All remelted, reclaimed or new zinc-base alloy.
Specification: Solidification upon cooling shall occur within the range 715° to 750°F (See fig. 1).

Steps in making test	Detail
1. Sample metal	*Fill test bowl with sample of metal to be tested.* Comment: Metal is taken from the melting pot at 800°F ±10°F. Care must be taken to secure a clean, representative sample. The bowl may be of any convenient size (2¾-in. diam by 5½-in. depth has been found suitable), and should be filled with metal within about an inch from the top, allowing space for insertion of the thermocouple. The bowl is held in a recess in the top of a small brick, gas-fired furnace.
2. Insert thermocouple	*Insert thermocouple into center of molten metal.* Comment: The thermocouple is connected to a recording and indicating potentiometer. It has been found suitable to use an instrument which moves the paper chart at a constant speed of 2 in. per hr, plotting temperatures at 5-sec intervals. The thermocouple is protected by a Meehanite cast iron tube 1-in. diam with ¼-in. side walls and end wall. The thermocouple is inserted so as to be in contact with the inner end of the tube. Caution: The thermocouple tube must not touch the test bowl at any point, since this would result in false readings.
3. Heat metal	*Heat metal to approximately 800°F.* Comment: Ordinarily, heating will be unnecessary since the sample is placed in the bowl at this temperature, but it should be noted that unless a sufficiently high temperature is attained, the first thermal arrest may not be indicated.
4. Cool metal	*Shut off burners, and allow metal to cool to 700°F or lower.* Comment: Neither test bowl nor thermocouple may be moved during cooling of the metal. At 700°F the metal has completely solidified, and the major thermal arrest has been indicated. Cooling to a lower temperature would serve no useful purpose, but would merely result in an increase in the time necessary to remelt the metal to permit withdrawal of the thermocouple.
5. Check upper limit	*Check temperature at first thermal arrest on recorder chart (start of solidification).* Comment: As the completely molten metal cools below 800°F, the temperature-time plot will be a straight line, indicating a uniform cooling rate. When cooling has progressed to the point at which crystals start to form, heat will be given off by the forming crystals, arresting the rate of cooling, and causing the line to change direction. These crystals will first appear in pure virgin type 5 alloy at approximately 730°F, (See fig. 1) but this temperature will vary with the composition of the alloy. Reduction of the aluminum content, or an increase in the percentage of high-melting impurities, will cause this value to rise. It may be further inferred that a high value indicates metal of poor casting properties, in most cases. Experience will permit evaluation of the general composition of the alloy, or of the quantities of impurities present, by observation of the size of the "knee" at this point.
6. Check lower limit	*Check temperature at major thermal arrest on recorder chart (completion of solidification).* Comment: This change in the direction of the plot is caused by the cessation of heat evolution upon completion of crystallization. Within normal variations in composition, this point (the eutectic temperature) will approximate 716°F for type 5 alloy (See fig. 1). None of the impurities commonly encountered will affect this temperature appreciably.
7. Record	*Record temperatures obtained above (5 and 6) as solidification range.* Comment: If this range falls outside the prescribed limits (715° to 750°F), the alloy should be blended with a sufficient quantity of high purity alloy, or the aluminum content adjusted to give a satisfactory alloy as indicated by a repetition of this test. Chemical analysis will usually be necessary in order to decide upon the proper adjustment.
8. Discard sample	*Reheat metal to permit withdrawal of thermocouple, and discard sample for later reclamation.*

will fail to fill out under the usual shot pressures but ordinarily the only evidence of oxide contamination will be a deposit on certain areas of the die surface somewhat similar to that which occurs when the magnesium content is high. The alloy should be kept clean by fluxing with one of the commercial products provided for this purpose (see table I).

Iron—When the iron content is high, it can contribute to practically any of the casting difficulties and surface defects known to the diecaster. Special care should always be taken to keep the iron content as low as possible. The aluminum content, if kept within specification, will do much in this direction but further reduction can only be obtained by blending with a higher purity alloy.

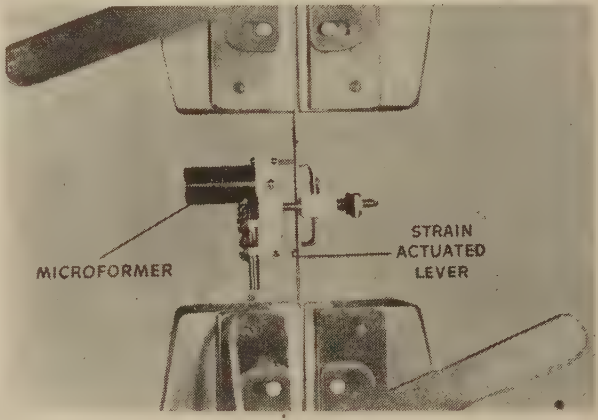
Lead, cadmium and tin—There is some evidence that lead, cadmium and tin, when close to the maximum limits allowed by specifications, will cause surface defects on castings made in critical dies. Certain brands of zinc consistently run well below 0.002 pct lead, with no cadmium or tin. When these brands of zinc are used, there are fewer castings rejected for poor surface, all other conditions being equal. Other brands, containing higher lead and some cadmium, invariably cause a lowered efficiency in casting. When castings of high quality surface are required, it will be found beneficial to hold these elements to a low limit. When lead, cadmium and tin appreciably exceed the maximum quantities allowed in the alloy (0.007 pct Pb, 0.005 pct Cd, 0.005 pct Sn), it will be found that the metal is hot-short and brittle. Sections will break off in the die and the castings will often fall off the gates.

High purity raw materials are always used in making up these zinc base diecasting alloys. Since contamination is generally due to foundry pickup, the need for good housekeeping practice in the alloying department is emphasized.

Strain and Deformation Recording System

DIRECT recording of the deformation occurring in specimens subjected to tension, compression or flexure in Universal testing machines is possible through the use of a strain recording system in which two miniature variable transformers, called Microformers, are the essential actuating devices. The assembly has been developed by the Baldwin Locomotive Works.

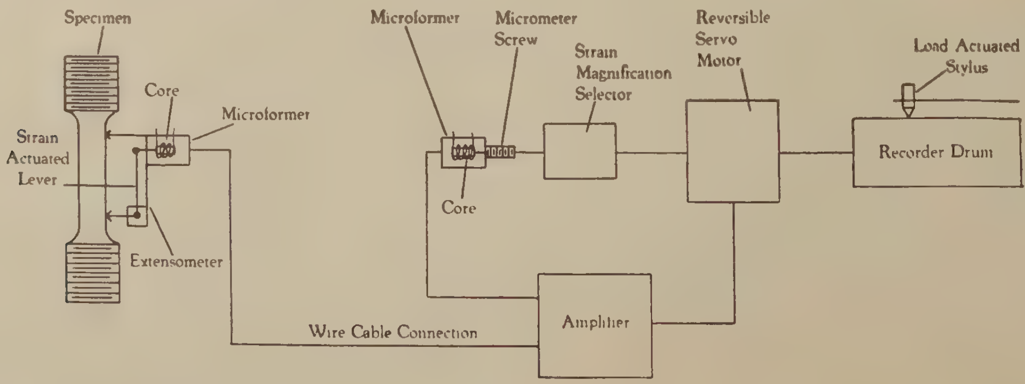
To trace the operation through the diagram shown below, deformation in the specimen actuates the movable core of the strain following Microformer, seen in the illustration at right, which thereupon changes its output and unbalances an electric circuit including a similar Microformer in the recorder system. The resultant electric impulse in the circuit is amplified to drive a servo motor which moves the core of the recorder Microformer until the electric circuit is rebalanced. At the same time, the servo motor is rotating the recorder drum in proportion to the sample deformation and creates the record of the test.



Applied load values, corresponding to the deformation, are recorded on the chart parallel to the axis of the recorder drum. This is accomplished with a mechanically actuated stylus controlled by the testing machine load indicator.

The recorder drum changes its direction of rotation automatically with changes in the direction of deformation in the test sample, and therefore the device is well suited to recording tests in which specimens are both loaded and unloaded.

Consistent accuracy of the Microformer controlled recording element has been established over a wide range of deformation speeds, and although the system is being used chiefly with strain recording devices designed for amplification of strains of 1000 times or more, it is readily adaptable to recording any pair of variables through the use of some index of each variable to actuate a Microformer.



Rapid Plating Range Test

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Research Chemist

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The rapid, practical plating range test for chromic acid baths, described in this article, is designed to enable platers to maintain the plating range at a maximum, where the control is expressed in chromate to sulfate ion ratio, without requiring continual chemical analyses. The test may also be effectively applied to chromate baths using catalysts other than sulfuric acid.

IF a plating current is allowed to pass through a slot, the current density along the cathode will drop as the distance from the slot becomes greater. The current distribution will be of a logarithmic form and a plating cell constructed on this principle is of value for practical plating range tests. Such a cell is shown in fig. 1.

The slot-cell has the advantage that the size and position of the anode has no effect on the current distribution inside the cell. Further, the cell can be hung directly in the plating bath or suspended in a beaker. This is convenient since it overcomes the objection of temperature control in small plating range cells.

The slot-cell can be varied to meet demands for plating range tests, but the immersion type slot-cell with a centered slot is ideal for measuring the plating range of a chromic acid bath.

The plating range of a chromic acid bath depends greatly on the $CrO_3:SO_4$ ratio. A plating range test applied to this bath is then a rapid measure of this ratio. But the $CrO_3:SO_4$ ratio is not as essential a control point as the plating range. Therefore, this test should be looked on as a means of controlling the plating range at a maximum where the control is expressed in terms of the $CrO_3:SO_4$ ratio. This ratio expression is convenient since it gives information on the amount of acid to add to change the plating range.

This test has advantages over chemical analyses for CrO_3 and SO_4 to determine the ratio. If analyses are made, they should be done carefully since two substances are involved in the ratio. Therefore rapid analytical methods may not allow operation at the maximum conditions. This means that gravity control of the chromic acid bath will not be satisfactory after impurities begin to build up in the bath. However, if the plating range test is used, then gravity control may be used since knowledge of the approximate CrO_3 content is sufficient for operation where the ratio does not have to be calculated. The plating range test has the further advantages of being rapid and applicable to catalysts other than sulfuric acid.

Fig. 2 shows horizontal sections from test plates illustrating how a set of standards was determined for the two chromic acid baths commonly used.

The chromium was deposited on clean copper sheets. The method of cleaning and whether or not the copper is etched has little effect on the width of the bands obtained in the test. If the test is to be used, it is well to run a set of standards. This is not necessary since the standards are permanent; but the standards are easy to run and give experience in the appearance of

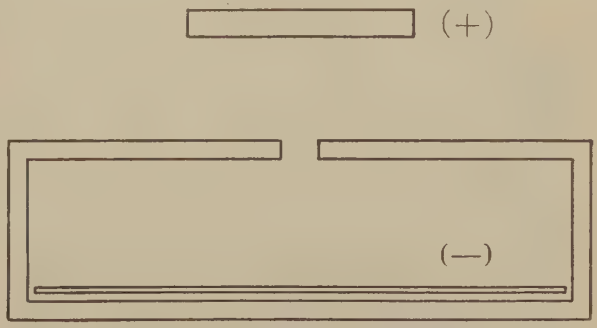

FIG. 1—Immersion type slot-cell for measuring the plating range of a chromic acid bath.

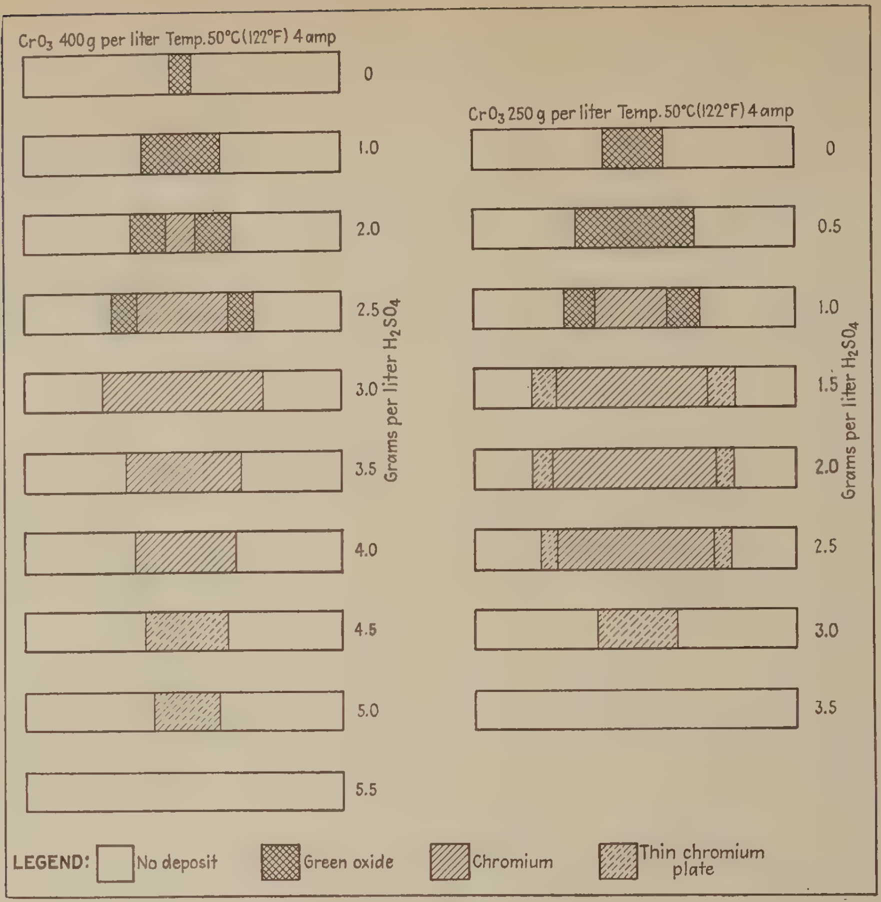

FIG. 2—Horizontal test plate sections show how a set of standards was determined for two commonly used chromic acid baths. The sections as shown are slightly less than half the actual size of the standard cathodes used in the test runs.

typical plates. Anodic cleaning[1] or any procedure that will leave a film on the copper cathode should be avoided. If the copper is etched prior to plating, the chromium plate will be matte, but if it is merely cleaned and dipped in acid, the plate will be bright.

From a test plate it can readily be judged if the sulfuric acid is low. A narrow band will be produced just as for high sulfuric acid but green compounds of chromium will appear at the edges of the band.

The standards shown are for a ¼-in. slot, 1 in. from a 4-in. cathode. If this same ratio is held, a larger or smaller cell can be made that will give a proportionate width of band. For instance, for the same average cathode current density a ⅛-in. slot, ½ in. from a 2-in. cathode will produce a band half as wide. The data shown are for an exposed cathode area of 2½x4 in.

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[1] *W. M. Tucker and R. L. Flint, Trans. Electrochem. Soc.* 88 335, 1945.

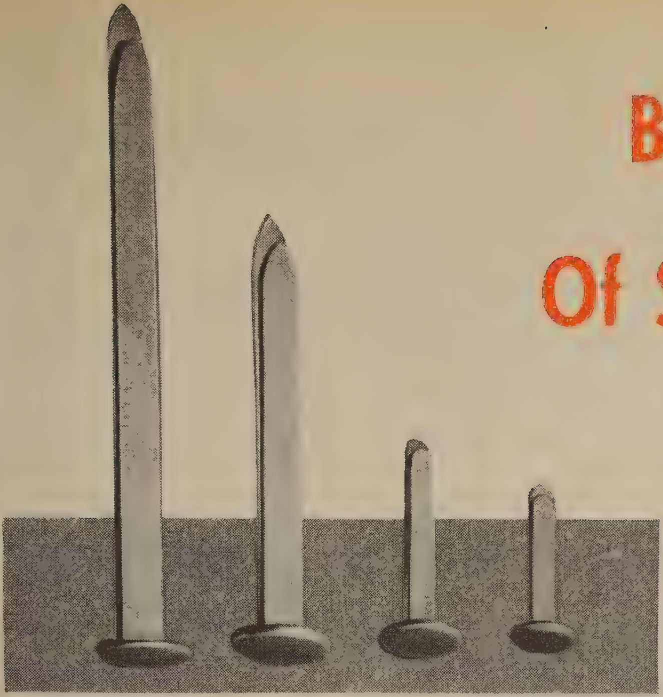
. . . NEW BOOKS . . .

"Non-Ferrous Production Metallurgy," by John L. Bray. Second edition of this book features recent developments, additional material on aluminum, copper, magnesium, nickel and tin, a chapter on the applications of physical chemistry to metallurgical processes and other information not contained in the first edition. The processes of production from ore to finished product are given in detail for the 24 most important nonferrous metals along with information on the history, uses, alloys, economics, marketing and prices of the materials. John Wiley & Sons, Inc., 440 Forth Ave., New York 16. 587 p. $6.00.

"Proceedings of Metal Powder Assn." Complete proceedings of the third annual Spring meeting (1947) of the Metal Powder Assn. are now available. The papers presented at the meeting with full discussions and illustrations are included. Metal Powder Assn., 420 Lexington Ave., New York 17. 70 p. $2.50.

* * *

"ASTM Standards on Copper and Copper Alloys." This 1947 edition compiles standards for copper and copper alloys including cast and wrought materials, electrical conductors, and nonferrous metals used in copper alloys. Testing methods are described for expansion, mercurous nitrate, tension, hardness and other tests. American Society for Testing Materials, 1916 Race St., Philadelphia 3. 462 p. $4.00.



Barrel Polishing Of Small Brass Parts

◦ ◦ ◦

By T. S. BLAIR
THE IRON AGE

◦ ◦ ◦

POLISHING of small brass paper fasteners is accomplished quickly and simply at the Simonsville Mfg. Co., Waterbury, Conn., by barrel polishing with dry maple sawdust. Adoption of the maple sawdust tumbling method for polishing followed experimentation with a number of other methods none of which gave the necessary quality of finish at as low a cost. The maple sawdust has small hard fibers, absent in softer woods, which act as a mild abrasive and give the fasteners a finish which, according to the company, will last for 2 years under normal exposure conditions.

The paper fasteners, as shown above, are stamped from brass strip and are dull and oily when turned into the finishing room. The polishing operation then involves two phases: (1) The removal of the oil on the surface of the part, and (2) the actual polish. The overall time cycle for each batch is 2½ to 3 hr. The pieces are rolled for the first ½ hr with previously used sawdust to dry and degrease the work, after which the charge is dumped and screened to separate the dirty sawdust and given from 2 to 3 hr polishing with clean sawdust.

Standard, open tilt, flat belt-driven barrels of truncated cone shape are used at Simonsville. The barrels are in two sizes, formed from steel sheet and unlined. The smaller size has a base diameter of 22 in., a top diameter of 16 in. and depth of 24 in. The optimum speed for this barrel is about 42 rpm and a comfortable charge at normal operating tilt is roughly 50 lb of fasteners along with an equal volume of sawdust. The somewhat larger barrels are 24x18x36 in. with 35 rpm the optimum speed and a maximum load of about 70 lb. Covers are used to prevent dust from continuously rising from the work but are not necessary to keep the work from spilling over the front lip of the barrel.

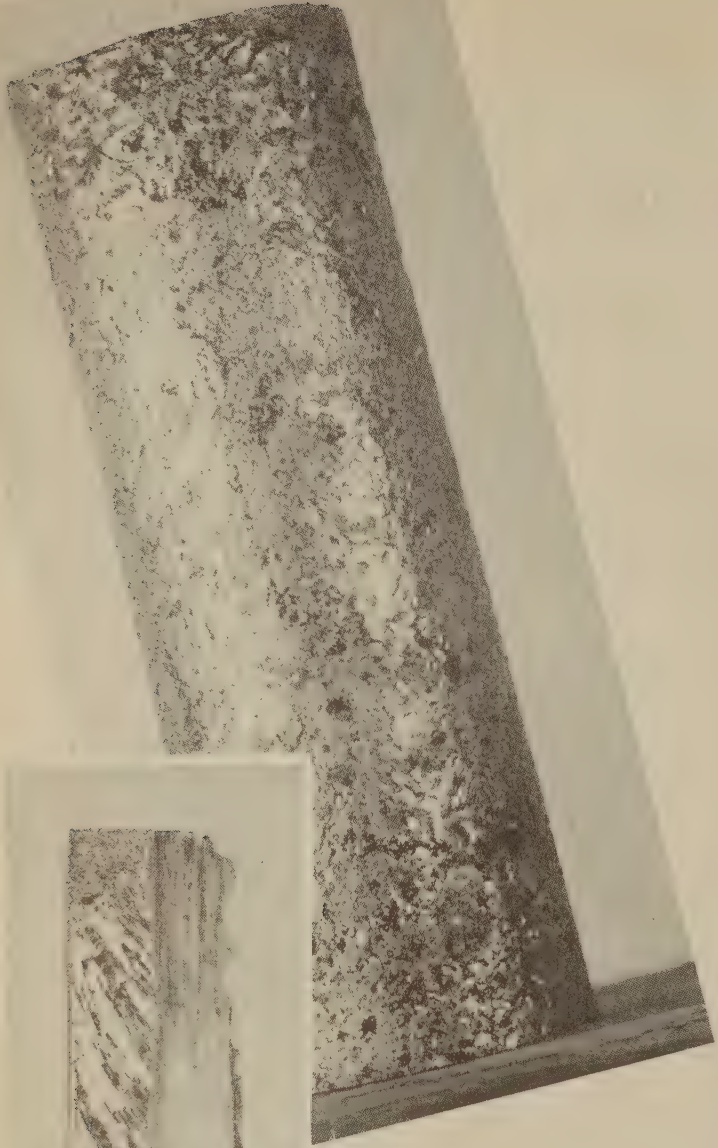
The tilt given the barrel determines the extent to which the sawdust settles to the bottom. Sufficient tilt is provided to keep the sawdust evenly intermingled with the work and this degree of tilt, about 45°, does not seriously limit the load which the barrel will handle.

Rotation speed is adjusted to give the maximum roll agitation to the work. This is the speed just short of the point where the work would be carried to the top of the barrel and dropped. It is the speed at which the work is carried about three quarters of the way up the side of the barrel and allowed to roll down over itself. Steps or vanes on the inside of the barrel effect more complete movement of the work in the load.

Friction involved in the rolling procedure sets up an electrostatic charge which makes small sawdust particles cling to the work. It has been found that this electromagnetism is easily discharged by sprinkling a very small quantity of water, two palmfuls for a 50-lb charge, over the work. This is done about 2 min before the end of the roll and allows dissipation of the static electricity so that the work is completely free of adhering sawdust particles when it is removed and screened.

Some of the larger sized paper fasteners require the addition of leather disks to prevent deformation, the company reports. The disks found to be most effective at cushioning the roll of the pieces are about 1½-in. diam, scraps from leather punching operations. The disks also contribute a great deal to polishing action, but could not be used without sawdust or the pieces would be discolored by glue from the leather laminations and would not be polished at the ends and other spots where the disks could not make good contact.

An interesting sidelight of small articles polishing is the tarnishing effect of the sulfur commonly present in paper packaging. The small brass pieces discussed in this article are not affected, but metal finishes of many kinds do show accelerated tarnishing because of this exposure. A dip into a dilute soap solution is recommended to combat the sulfur as it will impart a thin protective coating which will wipe off with handling in removal from the tarnish-producing package.



Deoxidation Control By Fractography

◦ ◦ ◦

By G. C. WOODSIDE
Metallographer,
Climax Molybdenum Co. of Michigan,
Detroit

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ABOVE

FIG. 1 — Photograph of an arc melted and cast molybdenum ingot.

◦ ◦ ◦

LEFT

FIG. 2 — Photograph of the ingot shown in fig. 1 after cutting and fracturing.

CONVENTIONAL metallographic polishing for microexamination of metals consists of polishing with successively finer and finer abrasives on a plane surface extending through many grains of the metal. In this manner, the metallographer is able to examine a cross-section of the grains and the grain boundaries. In most cases, the metallographer is primarily studying the grains of the metal and, to a lesser degree, is observing any small volume of constituent which concentrates at the grain boundaries.

By fracturing brittle materials and examining an unpolished grain surface which lies at right angles to the objective, it is possible to observe more clearly any constituent, such as oxide or carbide, which may be present at the grain boundaries. For the past several years the fractographic technique[1] has been used in the Climax Molybdenum laboratory in controlling the deoxidation of arc melted and cast molybdenum ingots.

Photographs and fractographs shown in figs. 1 to 5 illustrate the above method. Fig. 1 is a photograph of an arc melted and cast molybdenum ingot. Fig. 2 is a view of an ingot after cutting and fracturing. Fig. 3 shows fractographs taken at 500X showing an oxide constituent at the grain surface. Fig. 4 is a fractograph taken at 500 X showing a carbide and oxide constituent at the grain surface. Fig. 5 is a fractograph taken at 500X showing a carbide constituent at the grain surface.

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[1] *Zapffe and Clogg, Fractography—a new tool for metallurgical research, Trans. ASM, Vol. 34, 1945, p. 71.*

A series of experiments indicated that ingots which exhibited oxide films or dendrites in the grain boundaries could not be forged; they cracked up in the swages and fell into pieces. Ingots which contained no evidence of oxide in the grain boundaries but which exhibited carbide dendrites along the grain surfaces when examined fractographically were found to forge readily, and often withstood considerable abuse both in the amount of hot working at the higher temperatures and in working at lower temperatures (1400° to 1600°F).

The forgeability of pure molybdenum ingots is, therefore, readily predicted from fractographic examination, and the technique has become a control test for the evaluation of forgeability of molybdenum ingots produced by the vacuum arc process.

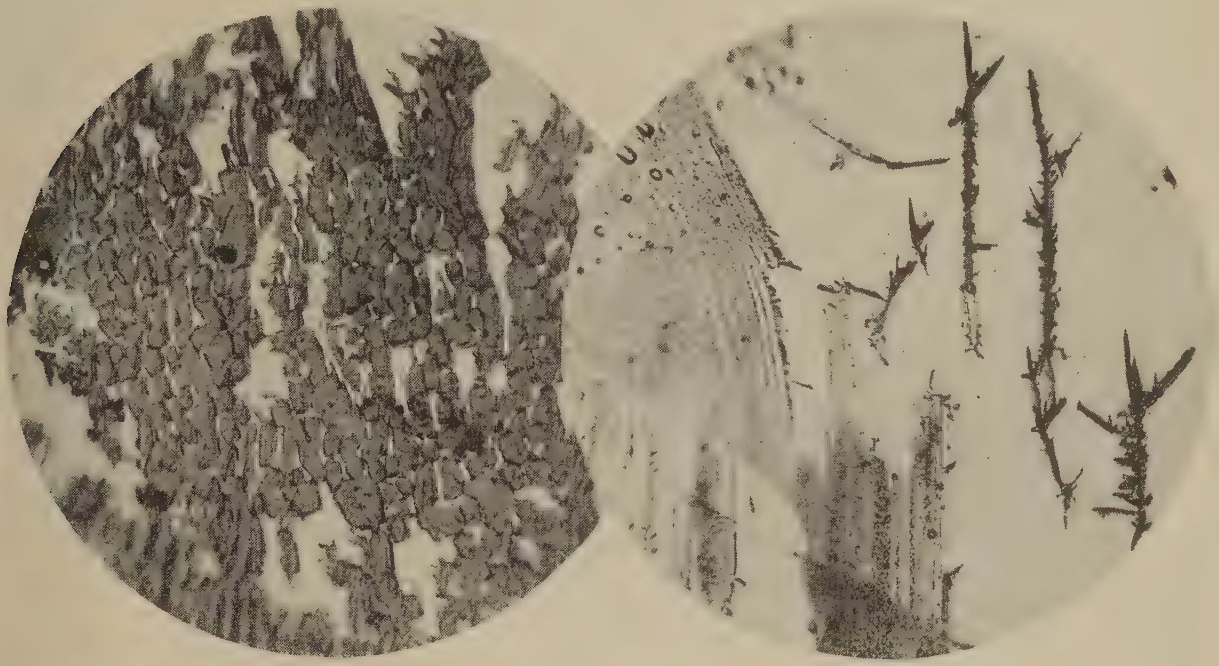


FIG. 3—Fractographs taken at 500X showing an oxide constituent at the grain surface.

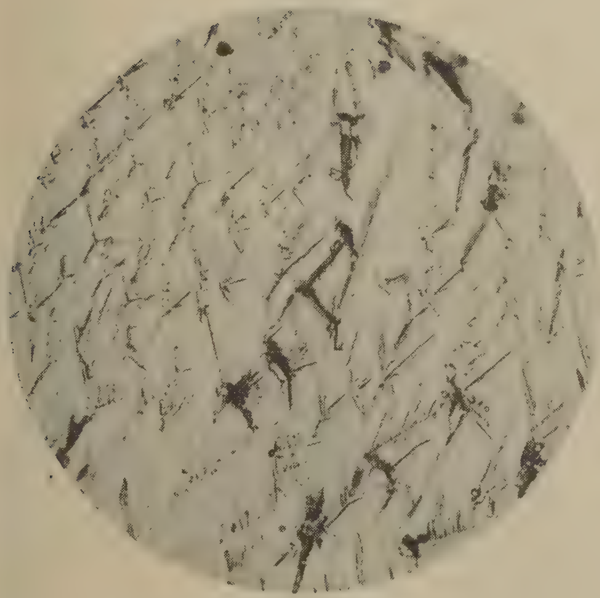


FIG. 4—Fractograph taken at 500X showing a carbide and oxide constituent at the grain surface.

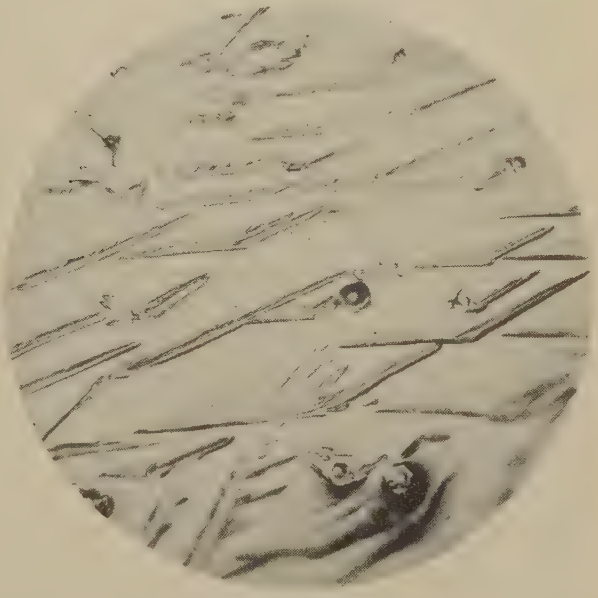


FIG. 5—Fractograph taken at 500X showing a carbide constituent at the grain surface.

Aluminum Strips Buttwelded

By DR. I. A. OEHLER
Director of Research,
American Welding & Mfg. Co.,
Warren, Ohio

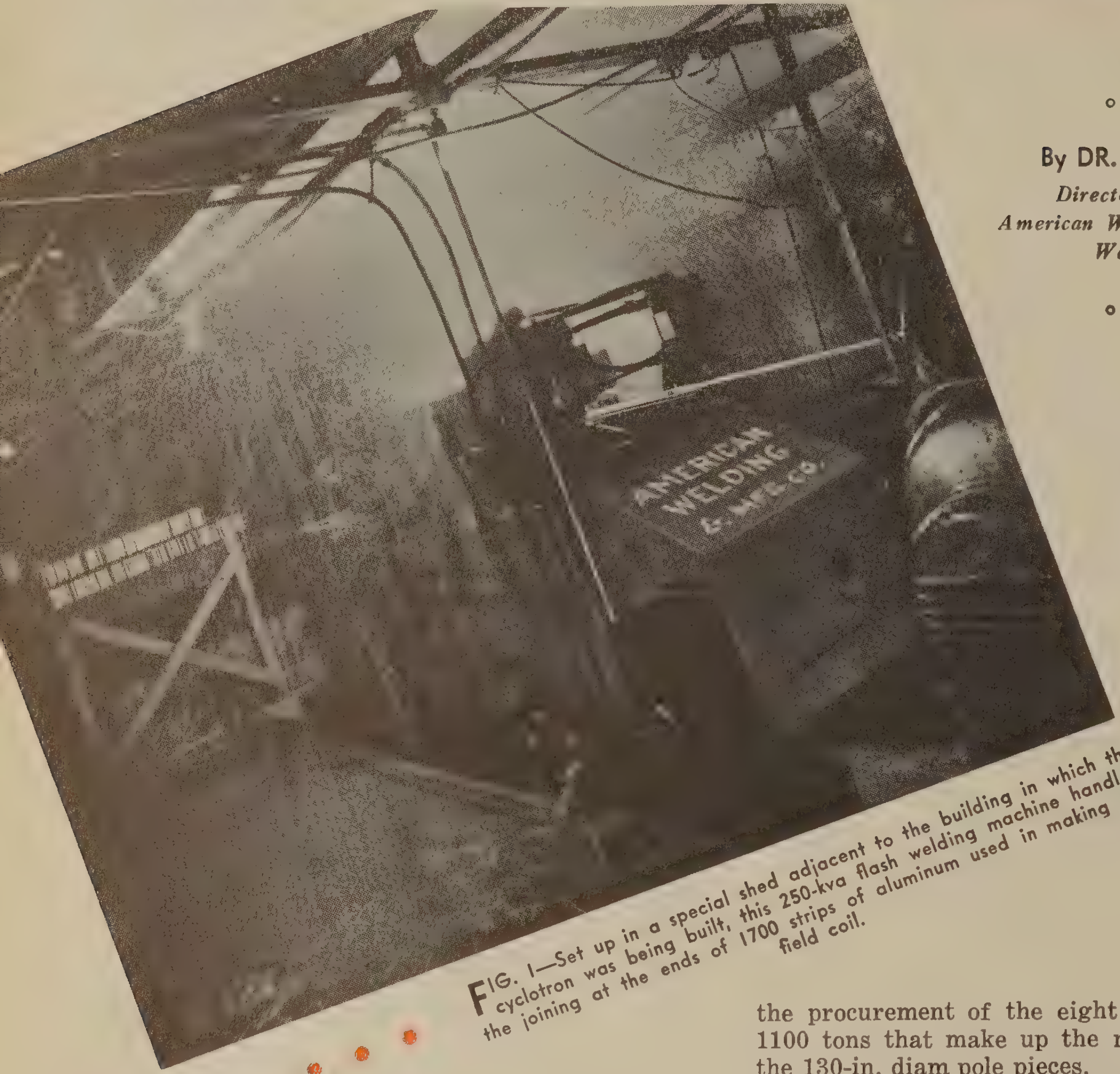


FIG. 1—Set up in a special shed adjacent to the building in which the cyclotron was being built, this 250-kva flash welding machine handled the joining at the ends of 1700 strips of aluminum used in making the field coil.

MORE than 16 miles of aluminum strip in the field coils of the new cyclotron at the University of Rochester, Rochester, N. Y., were flash buttwelded by American Welding & Mfg. Co., Warren, Ohio. Copper being in short supply when the unit was designed, aluminum with high conductivity characteristics was chosen as the coil material. The sections were 4x5/16 in. in cross-section and 62 tons were used in making the field for the new 250 million electron volt atom smasher. It is anticipated that aluminum will be satisfactory in producing the 16,500-gauss field required to accelerate nuclear particles.

American Welding & Mfg. Co., chosen to handle the work of joining the 1700 50-ft mill length aluminum strips into electrically homogenous mile-long strips for the 16 field coils, set up a special welding line adjacent to the cyclotron site. The production of the coils was the second element of the construction program, following the procurement of the eight forgings totaling 1100 tons that make up the magnet frame and the 130-in. diam pole pieces.

Past research and production of aluminum components welded by the electric resistance flash method proved the strength characteristics. Specific tests proved that conductivity characteristics would likewise be unimpaired.

The welding setup at the cyclotron site consisted of a 250 kva flash buttwelder, shown in fig. 1. The first phase of the welding procedure was the joining of the 50-ft stock lengths in fours, to make 200-ft strips, fig. 2. These were shifted to a storage pile from the welder on roller conveyers. Later, these 200-ft lengths were passed back through the welder for joining into a continuous strip as the 19-ft diam coils were being wound at the magnet.

Because the preponderance of resistance type welding is performed on steel, the handling of production work involving such nonferrous metals as aluminum is usually on something of an experimental basis. Methods for handling metals other than steel, however, are readily developed by simply relating the characteristics of the unfamiliar metal to those of steel so as to permit adjustments in welding procedure.

For most steels a rather wide range of weld-

For Cyclotron Magnet Coil

Some 1700 50-ft lengths of aluminum strip, measuring in cross-section 5/16x4 in., were buttwelded to form the field coils of the new cyclotron at the University of Rochester. This article describes how the work was done on a standard flash welder set up in a shed adjacent to the cyclotron site, and the strip was fed continuously from the welder to the winding crew.

ing conditions may be tolerated and good welds obtained. For nonferrous metals and heat resistant alloys, however, the metallurgical characteristics of the material require somewhat different conditions and much closer control.

Aluminum, with its high conductivity, low melting point, high oxidation rate and softness, requires higher currents, shorter cycles and faster application of forging pressures than steel, as shown in fig. 3. In terms of equation:

(Current flow^2) (Resistance of the Material) (Time of Flow) = Electrical Energy Input in Flashwelding.

Resistance, in turn, is the reciprocal of the conductivity of the material involved. In aluminum, which is more conductive than steel, less resistance is inherently offered to current flow. For an equivalent cross-section, less heating would result in aluminum than in steel with the same current input. Hence, it is clear that more current will be required for buttwelding aluminum than is required for steel.

The rate of upset motion will be higher in aluminum than in steel because aluminum is from four to five times more susceptible to undesirable oxidation at elevated temperatures. Thus, upset travel at 3 in. per sec is permissible with steel, while 6 in. per sec is the bare minimum velocity for aluminum. Forging pressure for aluminum is lower than for steel, as the aluminum is plasticized at lower temperature.

The timing of current cutoff after upset in welding steel is not critical because of the high melt-

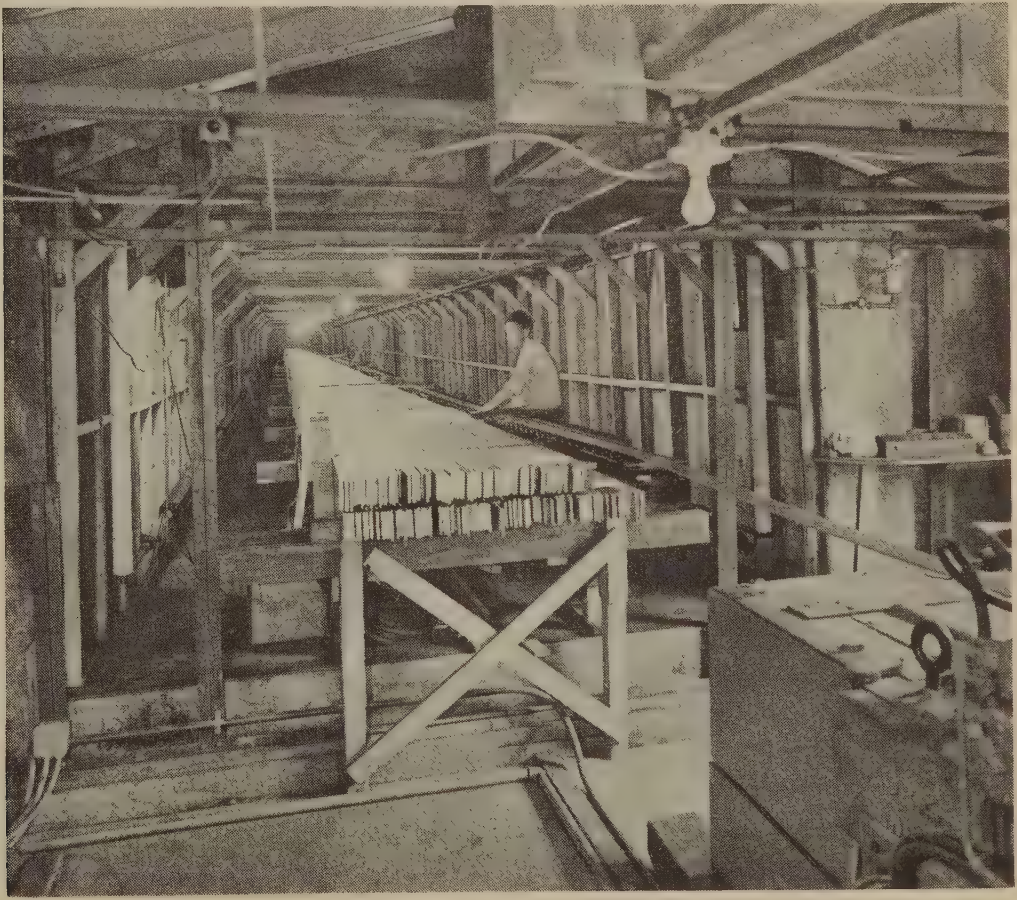


FIG. 2—The 50-ft strips were first welded in lengths of fours, making a 200-ft strip, and stored until the winding operations were started. Then these lengths were welded together as they were fed into the winding room.

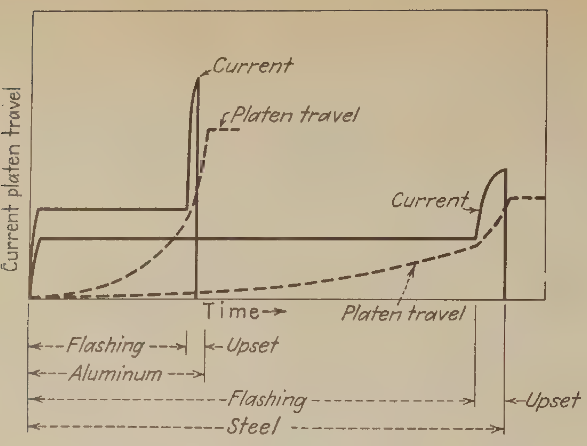


FIG. 3—Plotted current and platen travel against the time, this graph shows the relative flash welding cycles for aluminum and steel of the same cross section.

ing point of the metal. However, in aluminum, with its low melting point, melting must be more closely controlled because of the shorter range between forging and melting temperature. Current flow after upset should be of short duration because of the danger of carrying the whole weld area above the melting point and burning the metal.

The analytical process outlined was followed closely in setting up to weld the aluminum strips for the field coil of the cyclotron at Rochester. This same analysis is readily applicable to other metals. Consideration of the characteristics of an unfamiliar metal will establish a fair starting point for the determination of machine settings with a minimum of experimentation. While melting point and conductivity are the principal factors involved, other characteristics such as oxidation susceptibility and phase composition (in the case of bronzes), may have important effects and should be carefully explored in the analysis.

The machine used was a fully automatic, hydraulically actuated welder with electronic contactor and electronic heat control. It was necessary to develop a cam to control the motion of the welding machine and this development was made in our plant. Aluminum possesses a low melting point, high oxidation rate, and high thermal and electrical conductivity in comparison with steel. From a consideration of these factors, a cam was laid out and then checked experimentally.

Graphic meters and an oscilloscope were connected to the welder to record its action and the welds produced were checked for physical properties and microstructure. From the results obtained minor modifications in the cam and adjustments of other welder settings were made until welds of highest quality were consistently made. The welder settings were thereby determined for the production run.

The cycle adopted consisted of a 2.25 sec flashing period with current maintained after the pieces were forced together for six cycles or 0.1 sec. A total of 1 in. of the 1¼ sq in. section was consumed in making the weld, approximately half of this amount being burned off during the flashing or arcing part of the cycle and the other half being pushed out in the form of a flash during the upset or forging part of the cycle.

No preparation of the strip end was required

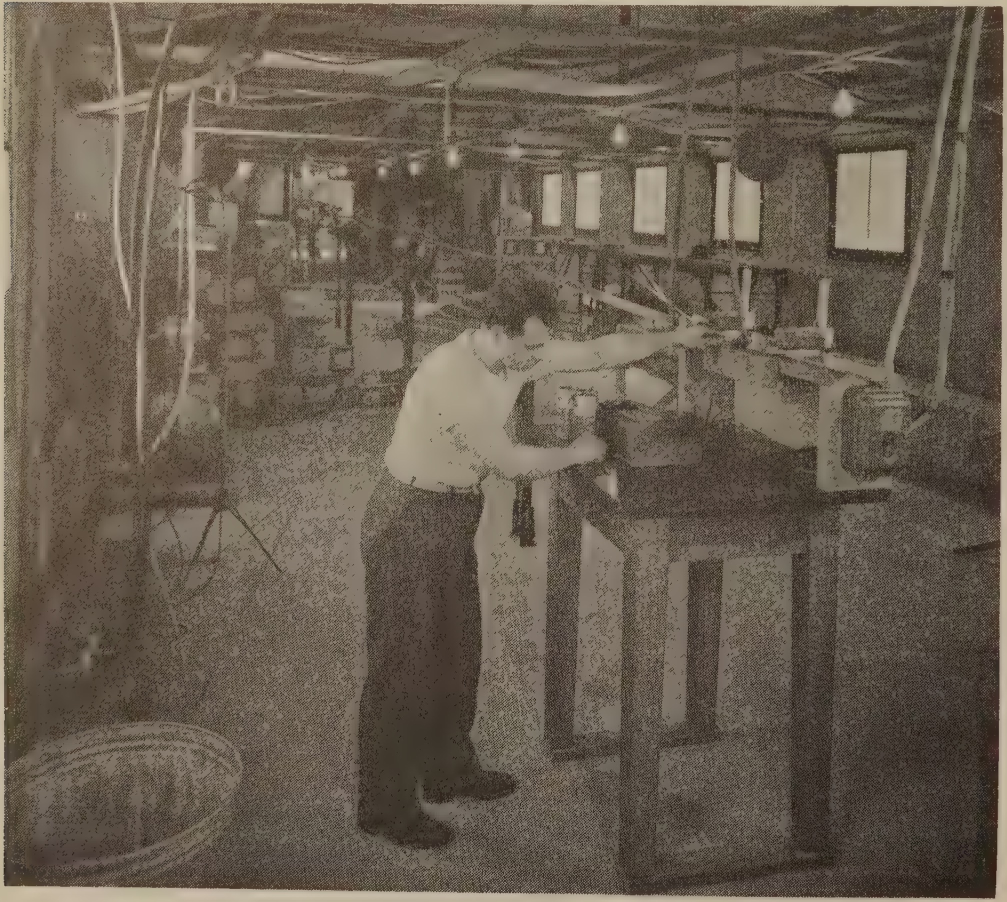


FIG. 4—Each weld was tested for conductivity, which was held to within 0.10 pct of that of the parent metal. The strip can be seen moving through conveyer rolls to the laboratory where it is being wound at the magnet.

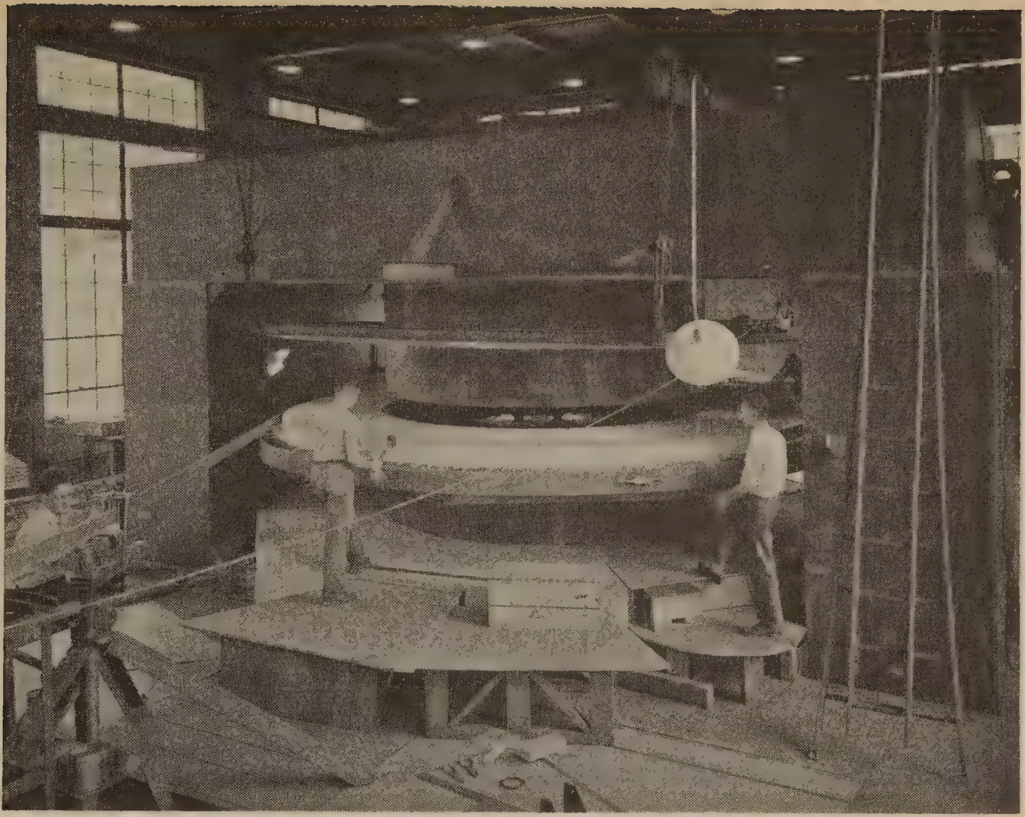


FIG. 5—Sixteen 19-ft diam coils were required to fit around the 130-in. pole pieces of the cyclotron magnet. Insulating paper is being fed into the coil from the rear.

as flashing was sufficient to insure squareness automatically. It was found that at the time of upset, welding current reached the value of 90,000 amp per sq in. The speed at which the pieces were forced together during upset had to be about three times that satisfactory for steel in order to get "a freeze" with the current on. If the current were interrupted before upset, an oxidized weld joint resulted. Each weld, upon completion, was tested by comparison bridge, as shown in fig. 4, and all were within 0.10 pct of the conductivity of the strip metal.

The welding machine fixture was designed to give high clamping pressure over a wide area without marring the stock surface. Outrigger straight edges were attached to the machine for alignment of the strips being welded.

Two milling machines included in the line finished the welds. The first machine milled the top and right side of the strip and the second milled the left side and bottom. The electrical test stand was the fourth station in the line.

In the final coiling operation shown in fig. 5, welds were made as required to keep the strip moving to the magnet. At the magnet the coils were wound in pairs from a motor driven turntable, the proper connections were made, a top plate was added, and the pair of strips dropped into place over the magnet poles. Three strips of insulating paper were coated with zinc oxide and fed into the coil from the rear to separate the individual turns. Tension was maintained by a clamp and indicator station through which the aluminum strip was passed. An intercommunicating system coordinated the activities of the winding crew and the welding station.

The same principles of handling apply to welding other nonferrous metals. Successful samples of the welding of copper coils have been produced by American Welding & Mfg. Co., preparatory to its next cyclotron job. This job will involve the welding of 4x9/32-in. copper coils for the Columbia University cyclotron, which will be constructed in the same general manner.

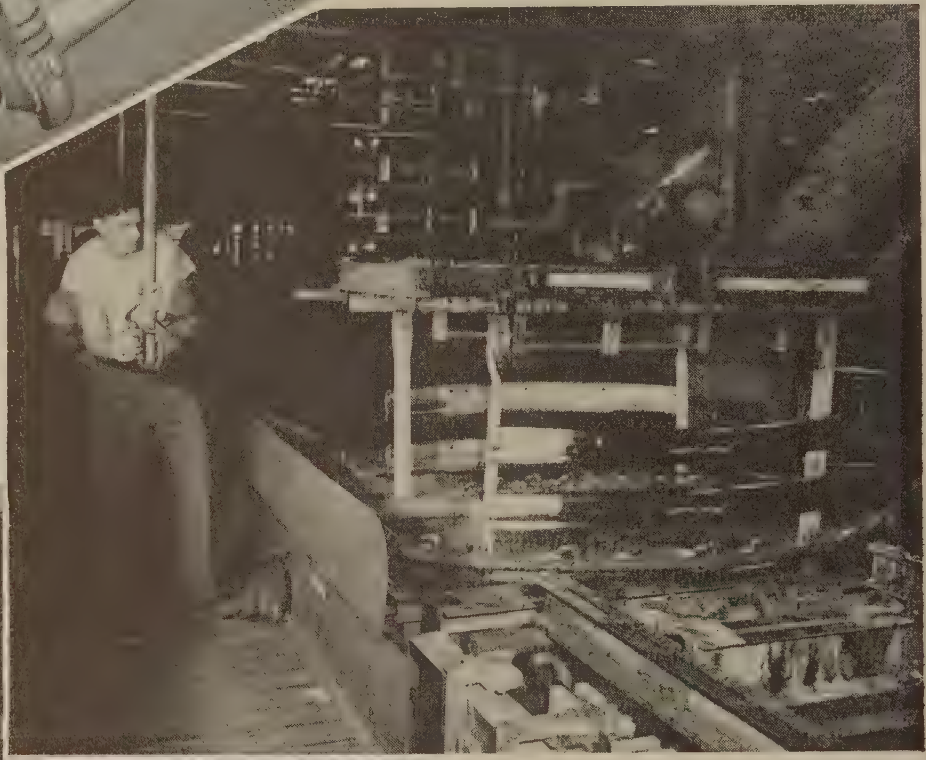
There is comparatively little common knowledge on the technique of flashwelding special alloys and nonferrous metals such as brasses and bronzes.

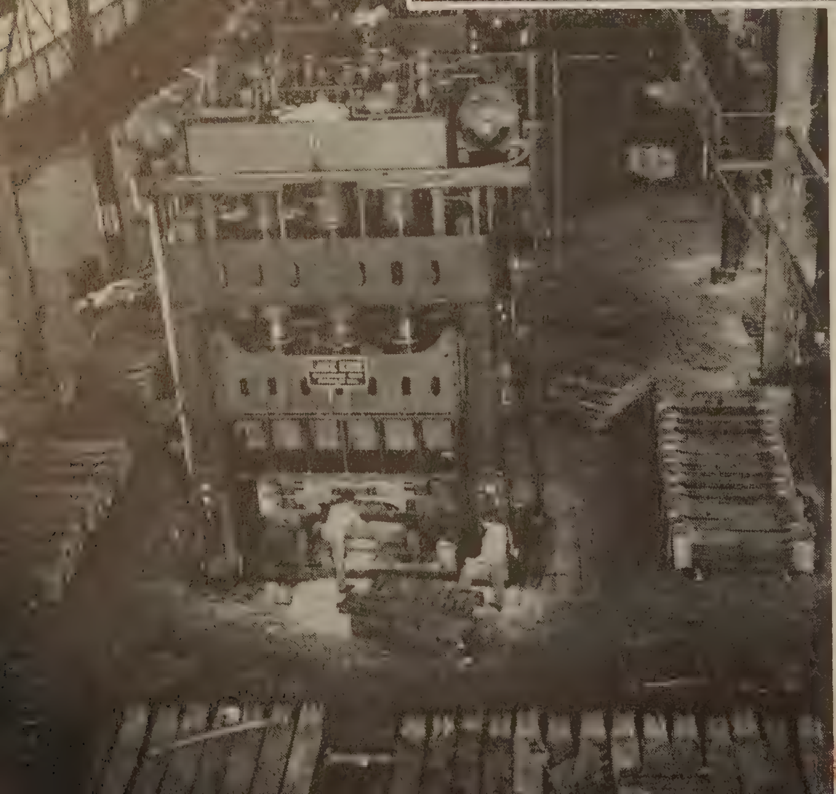
However, as pointed out, by relating the characteristics of the unfamiliar metals to those of steel, procedures can easily be developed for handling these metals.

Flashwelding brasses and bronzes is complicated since they are composed of divergent elements. Alloys in this category are copper and tin in varying percentages and existing in different phases in the same material. Flashwelding techniques adopted must take into account these peculiarities of composition. Conductivity of copper or tin is higher than steel, and higher currents will be required. Melting points are lower and quicker timing is necessary. Yet the range between the melting points of copper and tin is fairly wide, so that it is necessary to pass the melting point of tin to reach the temperature at which copper becomes plastic.

This poses the problem of selective volatization or melting, and it is possible to end up with a joint of different composition than the parent metal if welding temperatures are not controlled. Hence timing is critical, and the aim should be to produce high current flow for short duration so as to pass the tin melting point as rapidly as possible and to pass into copper's plastic zone by as little as possible. Rapid forging is necessary and the upset must be timed for high velocity. To keep the heating time to a minimum, a machine of larger capacity than would be required for flashwelding steel of the same cross-sectional area should be used.

Producing Bumpers





ABOVE

FOLLOWING chrome plating, bumpers are given a cold rinse (shown here). Note the arrangement of the overhead hoists for handling the racks.

○ ○ ○

LEFT

A SECTION of the press room of the Bumper Div. of Electric Auto-Lite. Large hydraulic presses are for the bumpers, while smaller presses handle auxiliary operations.

at Auto-Lite

• • An important supplier of bumpers to the automobile industry is the Electric Auto-Lite Co., Sharonville, Ohio. The production of a bumper to the exacting specifications of auto builders requires equipment and control methods belied by the size of an individual bumper. Pictured here are some of the steps in the production of a typical bumper at Electric Auto-Lite.

ABOVE

THE final hot rinse, following the copper and nickel plating operations, is the last step in the plating line.

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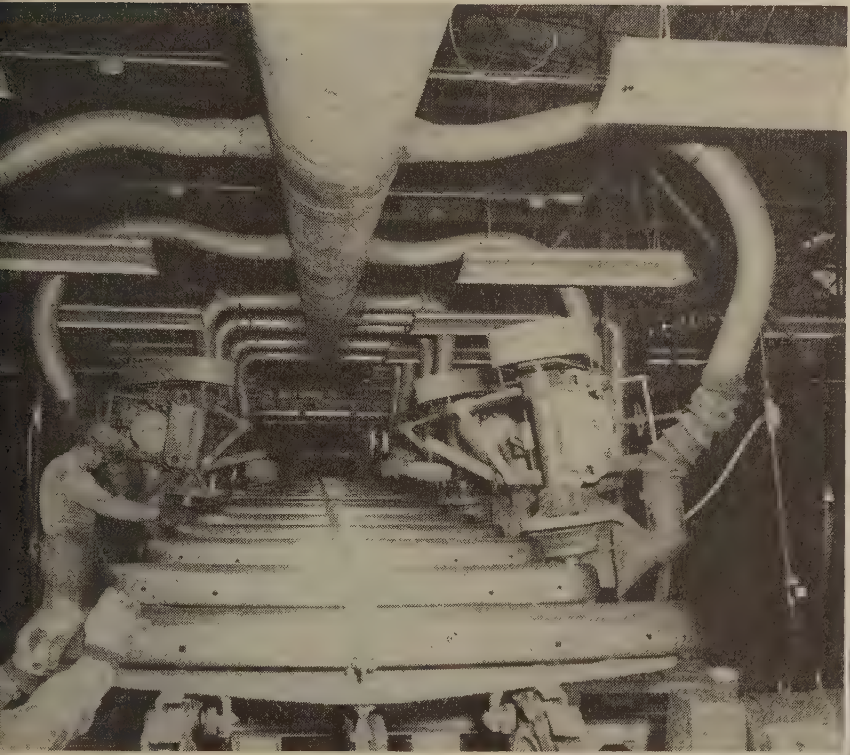


ABOVE

AN automatic unit (shown here) polishes the ends of the bumpers, while a nine-head rotary unit covers the other surfaces.

○ ○ ○

RIGHT

INSPECTION follows buffing in a Devine straight-line unit. Each buffing wheel is individually driven in this unit and is positioned in a manner to cover all surfaces of the bumper.

German Wartime Technical Developments

REPORTS of German practice in various technical fields of interest to engineers and executives in the metalworking field, issued by the Office of Technical Services, Washington, are briefly described below. Copies of the reports listed below may be obtained in either photostat or microfilm form, as indicated. Orders for copies of these reports should be addressed to Office of Technical Services, Department of Commerce, Washington 25, D. C., giving the "PB" identification number. See THE IRON AGE, June 27, p. 67, Aug. 29, p. 39, Sept. 26, p. 80, Oct. 10, p. 67, Nov. 14, 1946, p. 81, Jan. 9, 1947, p. 64, Jan. 16, p. 53, Mar. 6, p. 70, Apr. 17, p. 57, July 3, p. 66, July 31, p. 62, Oct. 9, p. 77, Nov. 13, p. 98, and for a list of earlier reports.

Iron Sulfate Recovery—Processes employed in Germany for recovering iron sulfate from spent pickling liquors are described in detail. The report states that in addition to recovering the iron sulfate, the processes check pollution of streams and improve the pickling operation itself. The investigator notes that over 100 such plants have been installed or have been ordered in Germany, and gives a resume of the uses and value of the recovered salts. *PB-80357; mimeographed $1.25; 46 p.*

Ferrous Materials List—German war list of rolled and forged steels available, arranged according to chemical composition, gives production statistics for the qualities of steel in production in late 1943 and early 1944, changes made in the composition of high speed steels during the war, and some information on methods of manufacture. *PB-79173; photostat $9.00; microfilm $3.00; 130 p.*

Mixed Alloy Steels—The feasibility of producing mixed steels by combining open hearth or converter steel with acid electric furnace steel to obtain a product of specified analysis and physical properties has been established according to this report, which claims that 100,000 tons of this mixed steel was produced at a saving of from 15 to 25 pct over standard production methods. *PB-80341; mimeographed 25¢; 6 p.*

High Temperature Alloys—Technical data on types of heat resisting alloys considered for or used in the fabrication of turbine blades for gas turbine and jet engines are covered in two reports. Specifications for a hollow air cooled blade with an air distribution insert said to make the use of lower alloy compositions possible are given, and testing methods for the alloy steels are discussed. *PB-80356; mimeographed 75¢; 21 p.*, and *PB-28557; photostat $6.00; microfilm $2.00; 89 p.*

Wire Straightener—A machine for straightening wire in the production of fishhooks which produces a pore free, condensed and highly polished surface as it straightens is discussed. The speed of straightening and cutting bars to length for fishing hooks is 300 per min, and it is claimed that bar stock up to nearly 1-in. diam can be handled. *PB-78726; photostat $1.00; microfilm $1.00; 8 p.*

Vacuum Melting—Additional data, to supplement previously issued report *PB-15196*, on the vacuum melting of metallic alloys are given. The process investigated will be limited, according to the report, because of the expense involved to production requiring extremely close composition limits, absolute minimum of gas content, minimum carbon content and prevention of loss of expensive alloying elements via oxidation. *PB-79588; mimeographed 25¢; 6 p.*

Hot Bloom Shear—A hot bloom shear, built without a fly wheel and which features push button control, cutting at two different speeds, air operated clutch, and hollow cast steel shear standards and blade carriers which are internally water cooled, is discussed in this report. Largest size machine has a shearing pressure of 1200 tons, cuts blooms up to 16x18 in. max and slabs up to 31.5x8.85 in. max, and makes about 3.5 cuts per min. *PB-80365; photostat $2.00; microfilm $1.00; 21 p.*

Tungsten-Free Hard Metal — Development data for a tungsten-free cast hard metal for tooling purposes are given. Vanadium and titanium carbides were used with iron as a binder. High quality production uniformity of the metal was not attained, according to one of the developers who was questioned, but some samples proved promising in equalling the performance of the more orthodox hard cutting metals. The report also describes the production and use of cast tungsten carbide in Germany and includes drawings of furnaces and equipment. *PB-78259; photostat $5.00; microfilm $2.00; 73 p.*

High Grade Iron Process—Sturzelberg process for making high grade pig iron by smelting comparatively low grade ores in batch rotary kilns using a calcium oxide flux is discussed. The process is not intended to compete with the blast furnace method, but is applicable where Swedish quality pig iron is required or where the special coking coals necessary for blast furnace operation are not available. *PB-78291; mimeographed 75¢; 26 p.*

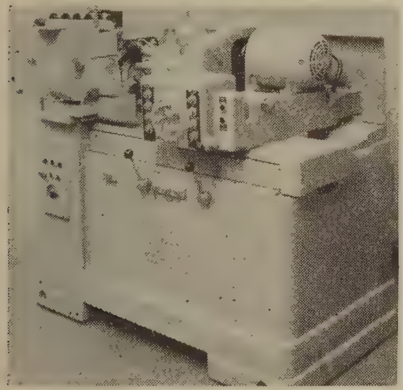
Tantalum Production—Processing of the ore and the methods of working the tantalum powder into rod, wire, sheet and tube forms are described in considerable detail in this report. Very high grade products, widely used as radio tube materials, were turned out at the rate of two tons per year according to the investigators. *PB-80567; photostat $4.00; microfilm $1.00; 41 p.*

New Equipment...

Recent developments in internal centerless grinders, a jig borer that bores 5-in. holes in mild steel or cast iron, a light milling pantograph, flash welder for welding flat mild steel stock, an electric motor powered metallizing gun, optical comparator for inspection and assembly operations, and various small tools are reviewed in this issue.

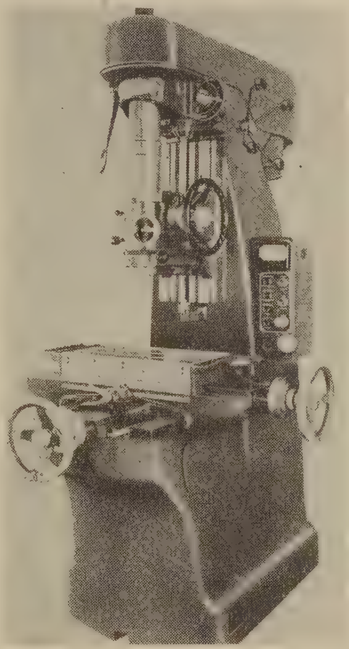
Internal Centerless Grinders

ADDED to the internal grinding line manufactured by the *Heald Machine Co.*, Worcester 6, Mass., is the centerless model 281 and the larger size model 381 both of which are fully automatic. The machines are designed for mass production and high precision on medium to large sized work which can be rotated on its outside diameter while grinding the bore. General features common to both models include a new feed mechanism which is so arranged that rate and amount of roughing and finishing feeds as well as the amount of retraction and compensation are set by turning knobs on the feed box. Protected anti-friction ways give maximum rigidity to the cross slide, eliminating cramping and sticking and insuring accurate feeds. New sealed-in permanent lubrication of workhead and grinding head permits extremely cool operating temperatures, it is said. Indicator readings show correct wheelhead belt tension. Improved maintenance features include ring type cylinders, steel piping with flare fittings, valves mounted on plates, and accessible self-adjusting brakes.



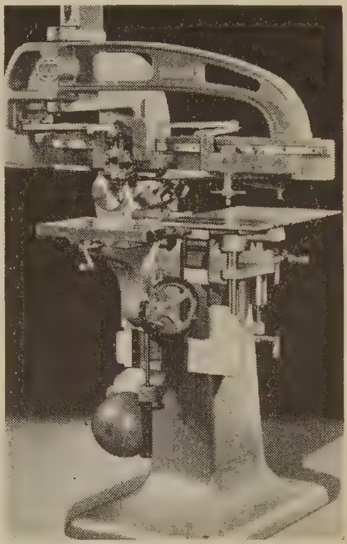
Jig Borer

SAID to jig-bore holes up to 5 in. in mild steel or cast iron, a jig borer, known as the No. 2 model, has been announced by *Moore Special Tool Co., Inc.*, Bridgeport, Conn. It features the principle of accurate lead screws for precise table settings and provides for heavier cuts and larger holes, it is reported. Infinite variable spindle speeds, push-button controlled, are provided, with a range from 90 to 2400 rpm. Three power feed ratios, 0.0015, 0.003 and 0.006 in. per revolution of spindle in either direction, constitute another feature. Specifications for the No. 2 model include table working surface of 10 x 19 in., table travel longitudinal, 16½ in., table travel crosswise, 10½ in., and table top to spindle end, 3 in. minimum and 18 in. maximum.



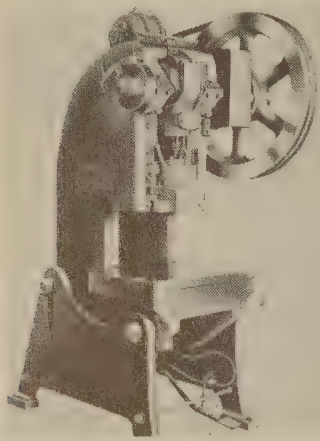
Light Milling Pantograph

A THREE-DIMENSIONAL pantograph machine, designated the P-13, has been announced by *George Gorton Machine Co.*, Racine, Wis., for light milling of intricate dies, hobs, molds and stamps. It features the Ratiobar, which is supported at either end by a balanced over-arm and aligns the pivot center, cutter spindle and tracing style in a straight line. One slider block is used to adjust reduction ratio. The Ratiobar carries the entire weight of the pantograph mechanism. The machine employs a three-dimensional pattern which is mounted on the copy table. The surface of this pattern is traced in three dimensions manually with the tracing style while the cutter reproduces at the desired ratio of reduction on the work piece the various angles and curves. The machine may be adapted for general two-dimensional light milling and engraving. Ratios from 2 to 1 to 40 to 1 are available.



Punch Press

STEEL welded punch presses in 70 and 100-ton capacities, featuring a brake which is applied only at the moment of clutch disengagement, have been announced by *Superior Punch Press Co.*, 3610 Superior Ave., Cleveland 10. As the brake is self-energizing, braking increases in pressure until the crankshaft reaches zero speed. The brake action is synchronized with the clutch so that when the clutch engages, the brake disengages and remains free while the press is in motion, resulting, it is claimed, in a saving of horsepower and elimination of brake drag. Standard stroke of the 70-ton press is 3½ in. and bolster plate is 22 x 32 in.

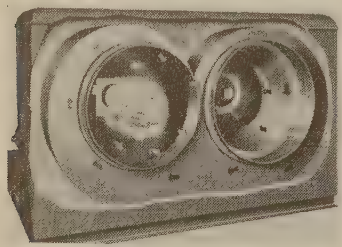


Welding Electrodes

WATER-COOLED resistance welding offset electrodes with brass water cooling tubes in place, bent to an offset and length to fit specific requirements, have been introduced by *P. R. Mallory & Co., Inc.*, Indianapolis 6. Offset centerline can be varied in ¼-in. steps from ⅛ in. to a recommended maximum of 1½ in.

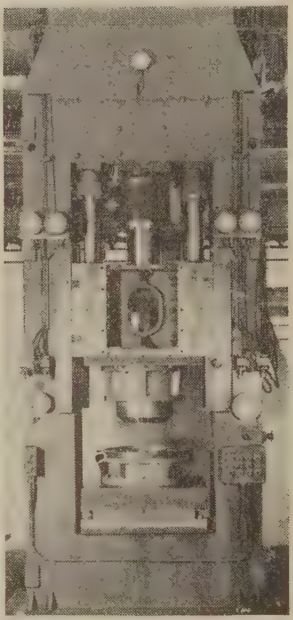
Oven Heater

A DIRECT gas fired heater, called the Scroll-Aire oven heater, which mixes the products of combustion directly into the air stream and which is recommended for paint drying ovens, core and mold ovens, moisture drying ovens and industrial processing ovens, is manufactured by *Newcomb-Detroit Co.*, 5741 Russell St., Detroit 11. Both the main and pilot burners are approved enclosed pressure type using low pressure combustion air. There is no open flame in the production department and positive control is said to be provided. The heater may be adapted to ovens of any design. Heaters are available in four standard units with 5000, 10,000, 15,000 and 20,000 cfm air capacities. A choice of burner capacities from 250,000 to 4,000,000 Btu is available. Other features are electric ignition, push-button starting and stopping and modulating temperature controls.



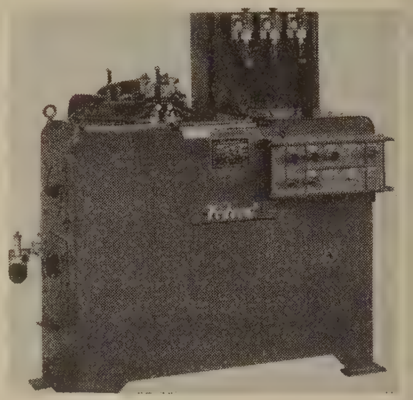
Deep Drawing Press

THE hydraulic double action deep drawing press, manufactured by *Hydropress, Inc.*, 570 Lexington Ave., New York, is of the selfcontained oil hydraulic type and operates at high speed. The press frame is a box-type all-steel, one-piece weldment of rigid construction in which the cast steel main and blankholder cylinders are inserted. The complete oil hydraulic drive with pumps and motors is mounted on the press proper. Control of the press is manual, semi-automatic or full-automatic. The main slide has a capacity of 100 tons; the blankholder slide, 50 tons. Both may be combined to obtain a capacity of 150 tons for single action work. Drawing speed can be obtained up to 225 ipm, at pressures up to 100 tons on the main slide, and fast advance and return speeds up to 1200 ipm.



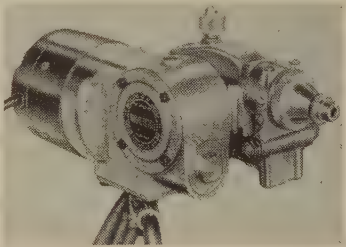
Flash Welder

DESIGNATED Type F-1, a flash welder conforming to RWWA specifications and built by *Federal Machine & Welder Co.*, Warren, Ohio, is designed for welding flat mild steel stock with a maximum width of 3 in. or for welding round and flat mild steel with a max cross section of 0.17 sq in. The mechanical cam-type upset mechanism is located below the weld line to prevent obstruction. Upset pressure of 2250 lb is applied to the work when a platen opening of ¼ to 2 in. is used. Platen size is 12x12 in. The machine is equipped with air-operated vertical clamps and adjustable upper and lower dies for correct positioning of work. Three pressure switches operate individually on each cylinder as sequence and safety switches. The unit is supplied with a 440 v, 60 cycle, single phase, ac, water-cooled 20 kva transformer.



Metallizing Gun

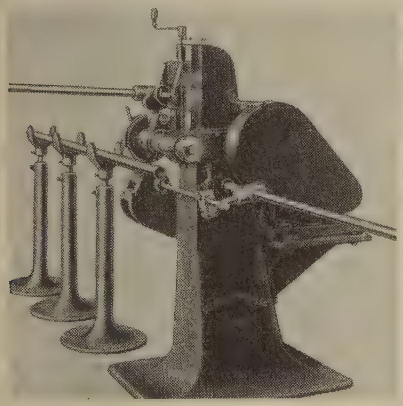
CALLED the Mogulectric metal spray gun, an electric motor powered metallizing gun has been developed by *Metallizing Co. of America*, 1330 W. Congress St., Chicago 7. It is suitable for line spraying or other types of spraying where top speeds are essential. By using different combinations of gearing most any spraying speeds can be obtained to spray any of the metals used in the metallizing industry. The unit is powered with a 1/20 hp constant speed induction motor, said to assure a uniform wire speed. It is said the wire will not feed too fast nor too slow and the only adjustments required are gas and air. The gun can spray vertically, up or down or at any an-



gle. Mogulectric is said to give a concentrated spray and leaves a dense coating of fine texture. It is available in 25, 50, and 60 cycles.

Pipe and Tube Cutter

THE Steen high-speed pipe and tube cutter, announced by *Continental Machine Co.*, 1952 Maud Ave., Chicago 14, is made in three sizes designated as the Nos. 3, 6, and 12 for cutting pipe or tubes from ½ to 3 in., ½ to 6 in., and 3 to 12 in. in diameter respectively. An attachment can be obtained for the Nos. 3 and 6 size for cutting pipe from ⅛ to ½ in. in diam. The shaft of the cutter and the gears of the unit are made of heat-treated chrome-nickel steel. Cutter block rolls are made of hardened tool steel. On the Nos. 3 and 6 tube and pipe cutters, the gage works automatically with the cutter arm. As the cutter becomes engaged with the pipe or tube, the gage is automatically released. Cutter blades are designed to withstand constant use on new and old pipe and are made with standard double bevels and long bevels.

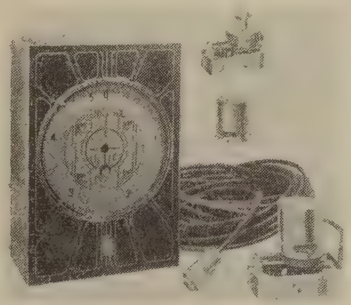


Pouring Furnace

A PILOT size pouring furnace which is selfcontained and designed for melting a wide variety of metals in quantities suitable for laboratory tests at temperatures up to 3500° has been marketed by *Boder Scientific Co.*, 719 Liberty Ave., Pittsburgh 22. This furnace is said to melt a 10-lb heat of gray iron in approximately 12 min and the same size heat of bronze in 6 min. The melting chamber is tilted and pouring accomplished by placing a steel rod in either the right or left pouring handle socket. The melting chamber is a spherical cast iron shell lined with monolithic refractory such as alundum, magnesite or sillimanite. Ports in the outer ends of the shell are provided for entrance of the graphite electrodes. Specifications are as follows: Indirect arc, automatic rocking, with two ¾-in. diam electrodes 24 or 36 in. long with water and electric connections. Unit operates on 230 v, 50 to 60 cycles, single phase, ac.

Pressure Gage

MEASURING working loads in tight, or inaccessible spots is said to be possible with a remote indication pressure gage and repeater station manufactured by *W. C. Dillon & Co., Inc.*, 5410 W. Harrison St., Chicago 44. The instrument indicates mechanical pressure in vises, chucks, presses, mechanical assemblies, and tension in moving filaments, rods, etc. Transmitter motor is mounted to the gage. When load is applied its electrical field is unbalanced. This electrical excitation is transmitted by cable to the repeater station where the field of the receiving motor is correspondingly unbalanced. Thus, whatever the transmitter motor deflects, the repeater instantly duplicates up to a distance of 300 ft. Six ranges are supplied: 0-100, 0-250, 0-500, 0-1000, 0-2500, 0-5000-lb models.



Boring Head

REDESIGN of the company's No. 12 offset boring head has been announced by *Flynn Mfg. Co.*, 433 Bates St., Detroit 26. Principal change consists of a more compact body to permit extension of the tool block nose beyond the body for close approach to work on recessed and hard-to-reach jobs. The wall of the tool grip has been increased ⅛ in. on each side and length of grip has been increased ½ in. Space between the ways has been reduced to centralize the adjusting micrometer screw and increase smoothness in operation. Square hole adjusting screws have been replaced with standard hex screws with one wrench fitting for all adjustments.

Optical Comparator

A WILDER projector and optical comparator marketed by *George Scherr Co.*, 200 Lafayette St., New York 12, has been designed for continuous quantity inspection and for the performance of delicate assembly operations on minute parts. To accomplish this purpose, the work stage and observation screen are close to each other and within the operator's reach and line of vision. Locating the lamp house overhead results in a vertical beam of light and a horizonal work stage which is said to be the most natural position for the majority of work and protects the operator from heat radiated by the projection lamp. The instrument when used for shadow images offers a choice of six magnifications; 10, 20, 31¼, 50, 62½ and 100X. The circular screen has a diameter of 14½ in.

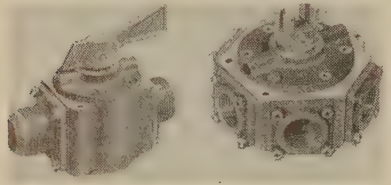
Tangent Benders

TWO new models of tangent benders, Single Wing type, have been developed by *Struthers Wells Corp.*, Titusville, Pa., supplementing the standard Single Wing tangent benders. These machines are entirely new and rugged, suitable especially for lighter work, smaller plants, or for plants where several machines are required in the production line. They will tangent bend sheet metal up to ⅛ in. or more in thickness as well as light structurals and tubing.

Selector and Shut-off Valves

A SERIES of non-lubricated selector and shut-off valves adapted to chemical and process service has been announced by

Parker Appliance Co., 17325 Euclid Ave., Cleveland. Handling air, gases or hot liquids up to 400°F, and at non-shock pressures as high as 500 psi, the valves are an adaptation of the company's aircraft types originally developed for rigorous military service. Available in a variety of metals, and designed with non-lubricated rotors of inert graphite, the valves are suited to the handling of fluids of varying degrees of corrosiveness. Valves can be furnished for hand operation, or electric motor-operation with a Bendix Geneva-Loc actuator. Shut-off valves range in size from ½ to 2-in. pipe size, and the selector series from ½ to 1¼ in.



Constant Feed Gear Pump

A SMALL capacity gear pump providing 50 cc's per min at 100 rpm has been developed by *Bijur Lubricating Corp.*, Long Island City 1, N. Y. The pump is said to maintain a constant feed under high pressure during operation of the machine. There are three types manufactured by the company: the universal gear pump which can be mounted in any position, the direction of drive shaft rotation determining the direction of flow; the reversible gear pump which maintains flow in one direction only; the sump type pump equipped with an integral fine mesh screen which may be mounted directly in the sump. Diameter of the base is 2½ in.

Carbon Arc Torch

THE Flexarc carbon arc torch for brazing, soldering and supplying heat for light forging, preheating before welding and tempering operations is available from *Westinghouse Electric Corp.*, P. O. Box 868, Pittsburgh 30. Each torch comes complete with two 10-ft extra flexible welding cable leads attached; one pair ¼ x 6-in. carbon electrodes; and one pair ⅜ x 6-in. carbon electrodes. Leads are equipped with bayonet attachment plugs to fit the company's WT midget marvel and limited input welders.

Gage Blocks

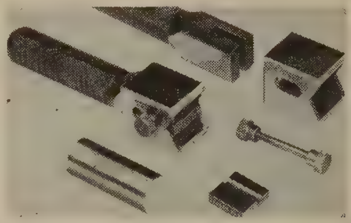
ANNOUNCEMENT of a new set of high precision A accuracy gage blocks has been made by the Small Tool & Gage Div., *Taft-Peirce Mfg. Co.*, Woonsocket, R. I. Made from finest alloy steel, these gage blocks are hardened and seasoned to insure durability and to retain accuracy, it is reported. Each set contains a complete assembly of all 81 standard sizes, as well as an additional block of 0.10005 in. The size of each block is marked on the edge for quick recognition and easy selection.

Face Mill

KNOWN as the E-Con-O-Mill, a carbide face mill has been developed by *Gairing Tool Co.*, 21221 Hoover Rd., Detroit 32, in standard sizes 5 in. diam and over. The same blades and locks fit all sizes of cutter bodies, which are cone type giving full height support to the blades, it is pointed out, and providing greatest unobstructed chip clearance. Slots are cut to such close tolerances as to permit replacing individual blades without regrinding the entire cutter, it is said. Blades, of the square tool-bit type, are furnished with all clearance angles ground to a gage ready for work. They are made in three types, with different radial rakes for steel, for cast iron, and for nonferrous materials. Locks are assembled in one piece and remain attached to the body when changing blades.

Bar Stock Marker

A SEMI-UNIVERSAL, self centering and self-alignin holder for marking various sizes o solid round bar stock with par numbers, serial numbers and hea treat data has been added to th line of products manufactured b *New Method Steel Stamps, Inc* 147 Jos. Campau, Detroit 7. Thi round bar marker consists of th holder, a V-block guide, a clampin pin, and either individual type o a logotype engraved with the re quired lettering or numbering. Th type fits into the grooved slot o the holder. The V guide slips ove the holder and marking die, an assembly is completed with the in sertion of a clamping pin. The guide slides up and down, auto matically centering and alignin the stamp on the bars of variou diameters when the stamp is i use.



Welding Tip Cleaners

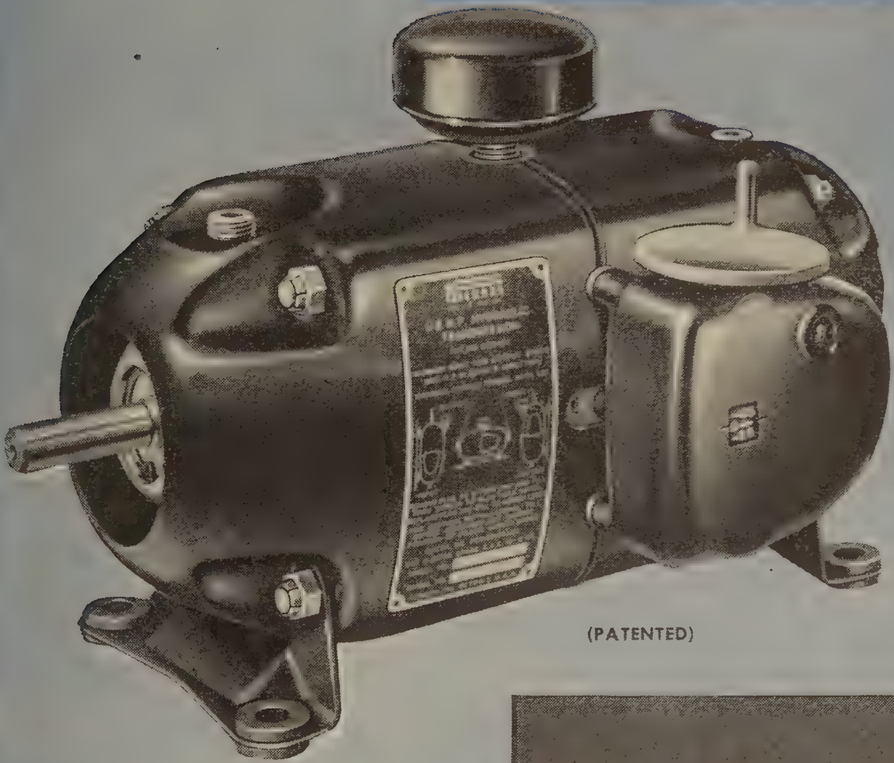
A SET of cleaners for acetylen welding tips, contained in a aluminum case, has been an nounced by *Thermacote Mfg. Co* 420 S. San Pedro St., Los Angele 13. Standard set of 12 cleaner will clean 27 drill sizes from Nos 74 to 49; the special set cleans 1 drill sizes from Nos. 47 to 30. Th cleaners are said to be speciall designed to clean tips withou damaging the ports, thus insurin a long, straight flame for clean slagless cuts.

Service Entrance Fitting

A SERVICE entrance fittin with reversible head has bee introduced by the *Adalet Mfg. Co.* 1448 E. 49th St., Cleveland. Th fitting is designed for use in th conventional upright manner, o the hub may be reversed in such way that the wires enter and leav the service head in the same plane Insulating covers are made of reinforced phenolic sheets and body and head are made of cast aluminum. The fitting is available from stock in 2½ and 3-in. pipe sizes.

VICKERS Variable Speed HYDRAULIC TRANSMISSION

1/2 Horsepower



(PATENTED)

PRICE

$75.00

Here is a compact, sturdy, variable speed hydraulic transmission for machinery drive. Any speed from zero to 1750 rpm—*in either direction* can be obtained without reversing the driving motor.

Effortless finger tip speed adjustment over the entire range is obtained by the handwheel control and the selected speed remains constant. A hydraulic servo control mechanism is also available. The full output torque is available throughout the speed range and the built-in automatic overload protection permits stalling without causing damage.

The Vickers hydraulic transmission is automatically pressure lubricated by the power transmitting medium (oil) for long and trouble-free operation.

Contact the Vickers Sales Engineering and Service Office nearest you for complete information.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Assembly Line . . .

WALTER G. PATTON

• Auto industry poised for a battle of automatic transmissions in '48 . . . High priced car buying slowing down . . . Ford outlines steps to get more steel . . . K-F divides $600,000 in employee fund.

DETROIT—The automobile industry is poised for a battle of transmissions in 1948.

For the past several years the major engineering effort of the auto industry has been directed toward perfection of a transmission that is fully automatic in operation. The one point on which automobile engineers appear to be in complete agreement is that automatic transmissions are "musts" in future passenger cars, particularly those in the high priced group.

Every automobile manufacturer has been working on some design for at least 3 years. Some car producers have been studying this problem intensively for 10 years or longer. Informed sources have reported that several car producers have at least three and as many as five transmissions under consideration at the present time. This includes transmissions built by their own engineering department as well as transmissions developed by outside suppliers.

The use of automatic shifting devices is expected to reach an all-time peak in 1948. Two new models—Buick and Pontiac will be introduced early in the year equipped with automatic gear shifting devices. Most sources here look for Hudson to put considerable emphasis on its automatic transmission with the introduction of its postwar model. Before the year is over several other producers are expected to introduce their entry in the automatic transmission sweepstakes. While it is not expected that the new Ford, Lincoln or Mercury transmission will be available when these new models are introduced to the public, there are strong indications that the Ford automatic transmission will be in production and available to the public before the end of 1948.

The new transmission which Buick will introduce early next year is said to be of entirely new design in the passenger car field. Most sources believe that at least 5 years of intensive engineering effort has been put into the new transmission. It is also believed that the new Buick device will have several advantages not available in the hydra-matic offered by Cadillac and Oldsmobile or the fluid drive offered by Chrysler.

Some idea of the growing popularity of Oldsmobile's hydra-matic is evidenced from the fact that 90 pct of the company's models have been equipped with hydra-matic drive compared with 75 pct in 1946. At the present time, it is reported, nearly 100 pct of the series "98" Oldsmobiles are so equipped.

OLDSMOBILE is now well along toward the sale of half a million automobiles in which the clutch pedals have been eliminated and fully automatic shifting in all forward speeds is provided.

Oldsmobile estimates that car owners who have purchased automobiles equipped with hydra-matic drive units in the last eight years have driven more than a billion miles without shifting conventional-type gears.

If automatic transmissions follow a familiar automotive pattern the new transmissions will be made available first as optional equipment at extra cost. The present price of a hydra-matic transmission is $186 on a Cadillac and $158 on an Oldsmobile. As volume increases, it is expected that production costs will be cut to a point where it actually may be cheaper to produce an automatic transmission than the present conventional-type which will then be required in much lower volume. At that time, most informed sources expect that automatic transmissions will become standard equipment and included in the list price of the car. Of course, this is at least 2 years away and may require an even longer period of time, although the return of an intensely competitive situation to the automobile industry could bring about this result sooner.

There are some indications that certain segments of the automobile market are filling up. A few months ago it became evident that the market for heavy trucks was pretty well saturated. This condition continues. More recently there have been reports that passenger cars selling at more than $3000 have become available on much shorter periods of time than heretofore. At least, order lists are reported to be much shorter than a year ago in the case of one manufacturer, although there is not yet sufficient evidence to indicate that this is an industrywide trend.

DESPITE the addition of 4 million tons of cold rolling capacity by 1950, A. J. Browning, vice-president and director of purchasing of Ford Motor Co., expects that steel will continue to be short through 1948, 1949 and even 1950.

At the present time, Mr. Browning pointed out, more than 3500 lb of iron and steel are required for a Ford car of which about 2700 lb are finished steel. During the year 1947, Ford purchases of steel will amount to 786,000 tons, an increase of 27 pct over the 1941 purchases. "However," Mr. Browning continued, "during 1948 it looks as if any important increase in production of Ford cars will be made only if our own mill can produce more steel."

Mr. Browning pointed out that Ford has made four major moves during 1947 to maintain present production:

(1) Increased purchasing from integrated steel mills which had not been bought up by manufac-

CARBIDE BURS STAR ON STAINLESS STEEL

Another Cost-Cutting Application of These Amazing P&W Tools

Notoriously tough to cut — stainless steel has always presented finishing headaches. But today many shops have found the answer to their problems with P&W Keller Carbide Burs.

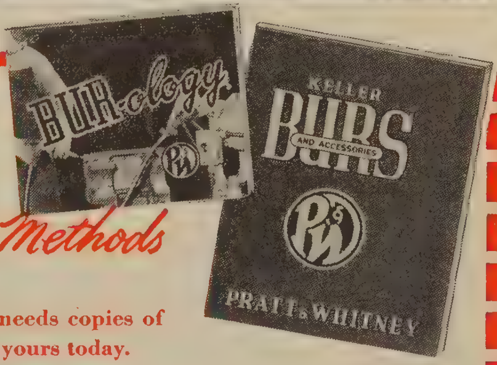
In the picture at right a Keller Shape P Bur (just 1 of the 53 types available) wades into welds on a stainless milk cooler. Excess metal is cleaned up far faster than by conventional methods and the resulting finish is comparable to fine grinding.

Such jobs are typical of the time and money-saving applications that are making P&W Keller Carbide Burs increasingly popular with production men all over the country.

For with these machine-ground, super-efficient burs you can alter dies hardened up to 65 Rockwell C and cut at an amazing speed through cast iron. More than that, they'll outlast ordinary steel burs 75 to 1 and up. When finally worn dull they can be returned to us and resharpened like new — ready to start work all over again.

No matter what your finishing and burring operations, let the men who developed the world's most advanced line of flexible-shaft equipment help you find a money-saving short cut. Just bring in or send a sample of the job you want done. P&W's Kellerflex engineers will be glad to work out the right answer for you.

The last word on Flexible-Shaft Equipment and Methods



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PRATT & WHITNEY

Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT

turing firms or ceased operations, as had some nonintegrated mills.

(2) Contracted for conversion of billets which were produced at River Rouge.

(3) Done a good deal of horse-trading of coke from the Rouge furnaces for pig iron and sheet steel.

(4) Increased the output of Ford's own steel mill at the Rouge.

Ford executives are not unmindful of the fact that Ford's 1947 production is only 3 pct under its 1941 total, while GM's is 25 pct less than the output for 1941.

The fact that Ford expects to use more aluminum in its 1948 cars than any other producer would indicate that company officials are seeing to it that any failure to increase its steel supplies as planned in 1948 will be minimized. Current reports, for example, indicate that installation of the new steel mill transferred from Granite City, Ill., to the Rouge may be delayed several months. Originally, it was expected that the new facilities would be available in March 1948.

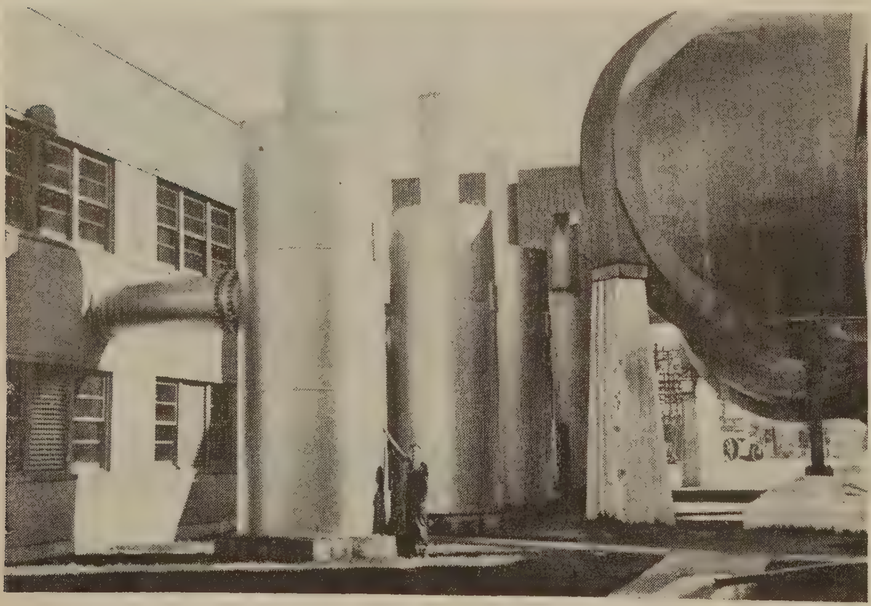
KAISER-FRAZER indicates that it has $600,000 tucked away in its trust fund for the year 1947.

Since Dec. 2, 1946 K-F has paid $5 into the fund for every car manufactured and shipped from Willow Run. In addition approximately $1 per rototiller shipped from Willow Run has been added to the fund. On Dec. 19, checks will be distributed.

To share in the K-F kitty, the employee must have been on the active payroll on Nov. 23, 1947, have worked a minimum of 90 shifts during the past year, and worked a minimum of 90 pct of the scheduled shifts from Dec. 2, 1946, to Nov. 23, 1947. Also, workers must not have been found guilty of wilfully agitating, encouraging or participating in any slow-down, work-stoppage or strike in violation of the terms of the K-F union contract.

The appointment of Charles E. Carll as director of public relations of Ford Motor Co., announced this week, will undoubtedly prove to be one of the most popular appointments by Ford in recent months. A former executive in midwest and eastern newspapers, Mr. Carll first joined Ford in 1942, remaining until late 1943. He returned in late 1944 as head of the Ford News Bureau, a post which will now be taken by John L. Rose of the news bureau staff. Mr. Rose is a former United Press staff correspondent and has worked for several midwest newspapers. The Ford Public Relations Dept. will include the news bureau, community relations, graphic arts and guest relations sections.

NOISE-KILLERS: *Despite these noise-killers that have been installed in the NACA flight propulsion research laboratory at the Cleveland airport, nearby residents have started a campaign to have the noise emitted from the laboratory whenever a new engine is tested eliminated. They complain that windows rattle and pictures bounce on the wall when engines are tested.*



Electric Furnace For Tempering Punchings At Allis-Chalmers Co.

Milwaukee

• • • **Among equipment recently installed to increase production of large transformers and feeder regulators at the main works of Allis-Chalmers Mfg. Co., Milwaukee, is an electrically heated, 180-kw, 208-v, three-phase high temperature elevator furnace for tempering punchings of magnetic material in a hydrogen or nitrogen atmosphere up to a maximum temperature of 2150° F.**

"The new furnace will add capacity for all grades of steel at a time when we are doing our utmost to shorten delivery time on transformers," J. M. White, vice-president in charge of manufacturing, said.

Loading dimensions of the furnace are 11 ft by 8 in long by 40 in wide and 20 in high. Two loading cars are provided, each having a driving motor so that the car can be conveniently run under the furnace for automatic raising into position, or run out from under the furnace.

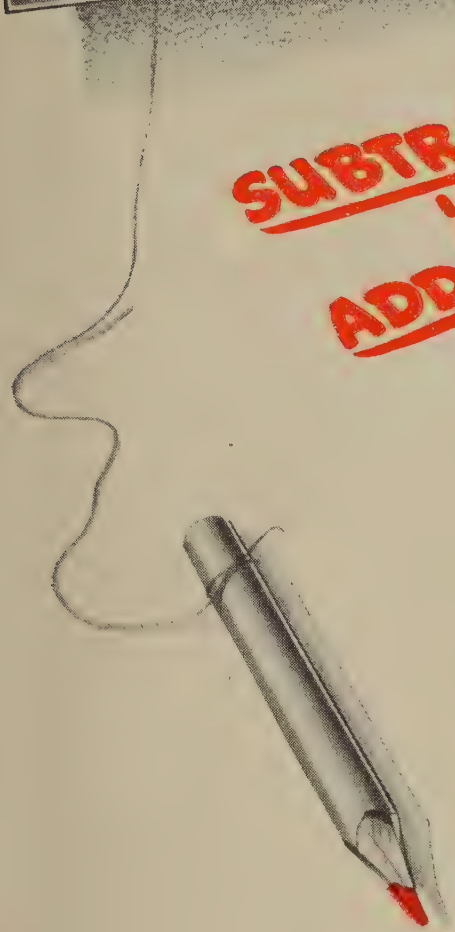
New atmosphere equipment installed for the production of nitrogen includes a 500 CFH output high ratio type combustion propane gas converter, 500 CFH output carbon dioxide removing equipment, and a dual chamber absorption dryer. For the processing of hydrogen, a copper purifying furnace, a cooler, and a dual chamber absorption dryer have been added.

Scrap Officers Elected

Cincinnati

• • • **At a recent election** of the Cincinnati Chapter, Institute of Scrap Iron and Steel, Inc., held at Cincinnati, the following officers were elected for the ensuing year: President, Ralph Kopelove, Dayton; Vice President, Roy Admans, Cincinnati, and Secretary and Treasurer, Louis Goldberg, Portsmouth, Ohio. Members of the Executive Committee are Ben Schottenfels, L. W. Pyrce, Emil Klempner, Joseph Mansbach and Joseph Summer.

THE *NEW* ARITHMETIC IN STEEL



SUBTRACT— ¼ OF THE STEEL PER PRODUCT—

ADD— ⅓ MORE PRODUCTS PER TON

3 TONS OF N-A-X HIGH-TENSILE WILL DO THE WORK OF 4 TONS OF CARBON SHEET STEEL—WITH NO SACRIFICE IN PRODUCT STRENGTH

N-A-X HIGH-TENSILE is now making possible the production of more and better products per ton of steel in many plants.

It is a common experience to find that sections can be made as much as 25% lighter—with no loss of strength, and with an increase in durability. That is because N-A-X HIGH-TENSILE is so much stronger and tougher, so much more resistant to fatigue and corrosion, than ordinary carbon sheet steel. The difference between the two is so marked that three tons of N-A-X HIGH-TENSILE will ordinarily do the work of four tons of the other.

Yet with all its strength, N-A-X HIGH-TENSILE has excellent formability. It can be cold-formed and deep-drawn to produce intricate parts; and it has good weldability. These superior qualities bring you not only a better product—but also important economies in handling, fabricating and finishing.

The many advantages of N-A-X HIGH-TENSILE have created a demand that is in excess of the current supply. However, our engineers will be glad to discuss your specific problems with you against the day when this superior steel is available to all.

MAKE A TON OF SHEET STEEL GO FARTHER

Specify—

N·A·X

HIGH-TENSILE STEEL

GREAT LAKES STEEL

Corporation

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
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GREAT LAKES STEEL CORPORATION

West Coast . . .

ROBERT T. REINHARDT

• Plumbers' pipe reaches new high on gray market . . . Arrival of LST's in Seattle heralds scrap price drop . . . Utah has another "Geneva" problem.

SAN FRANCISCO—Inequitable distribution by manufacturers and "speculating dealers" are being blamed for the shortage of small diameter galvanized and black pipe and the consequent gray market in this commodity, which apparently is flourishing from Seattle to Phoenix, Ariz.

Master plumbers in the northwest are taking their complaint directly to the public in their effort to eliminate the gray market and to explain why plumbing costs are rising. These craftsmen report that plumbing supplies obtained through "legitimate" channels are the shortest experienced in that area.

The master plumbers contend that there is a definite movement into the Seattle area of materials which are made available at a "price." It is stated that fixtures and pipe can be had if one is willing to pay a price of anywhere from 20 pct to 100 pct above the regular dealers' request. W. A. MacDonald, state president of the Master Plumbers' Association, and the group's executive secretary, Ray Malone, cite several instances of considerable quantities of pipe being offered at gray market prices.

In one instance a "broker" offered a carload of pipe which he had obtained in another part of the country. In explaining his asking price, he stated that he had to pay considerably above the established market price and was adding only a three to four pct profit for himself.

This particular lot included ¾ in. black pipe, which lists ordinarily for about $9.00 per 100 ft, offered at $20.00; ½ in. black pipe that ordinarily sells for about $7.00 per 100 ft offered at $16.85. Other prices ran in the same proportionate increase.

A similar situation exists here in San Francisco, although offerings have been few and far between. Strangely enough, one of the largest users of small diameter pipe for the conveyance of gas in this area reports that it has not been approached by any "gray marketeers," even though the company is in desperate need of pipe. Some of the smaller contractors report that they have not only been offered gray market pipe but have been forced to purchase it at prices anywhere from 50 pct to 100 pct above market lists.

Los Angeles builders are reporting the same situation, although allocations to that area have more nearly met requirements.

In Phoenix, Ariz., ½ in. galvanized pipe, which should sell for approximately $9.00 per 100 ft, is being brought in and finding ready buyers at $20.00 per 100 ft, and ¾ in. galvanized, which ordinarily sells for about $11.00 per 100 ft, is going at $30.00. The same situation applies to bathroom fixtures. Toilets which ordinarily sell for $42.00 are bringing $62.50.

Builders there are placing most of the blame on the inequitable distribution of pipe, which, they state, does not take into consideration that Phoenix now has four times the population it had in 1939, and is continuing to grow.

There seems to be little opportunity to stamp out this gray market in plumbing pipe because the added cost of from $20.00 to $30.00 for 100 ft of pipe is no deterrent when the home is ready to occupy with the exception of that necessary material.

As was found in a survey of the gray markets in sheets, there is more talk available in the gra market than there is pipe. Whil not yet reported in the steel industry, one instance in the lumbe business might well be repeated A lumber dealer had a few carload of material which he offered fo sale at something well above th going price. Several brokers too up the job of selling it and it wasn' long before the original dealer wa being offered his own materia through a fifth or sixth person.

SEATTLE—Arrival of 20 LST' here for disposal by the Maritime Commission was the signal fo a mild celebration by scrap users although dealers viewed the development with mixed feelings.

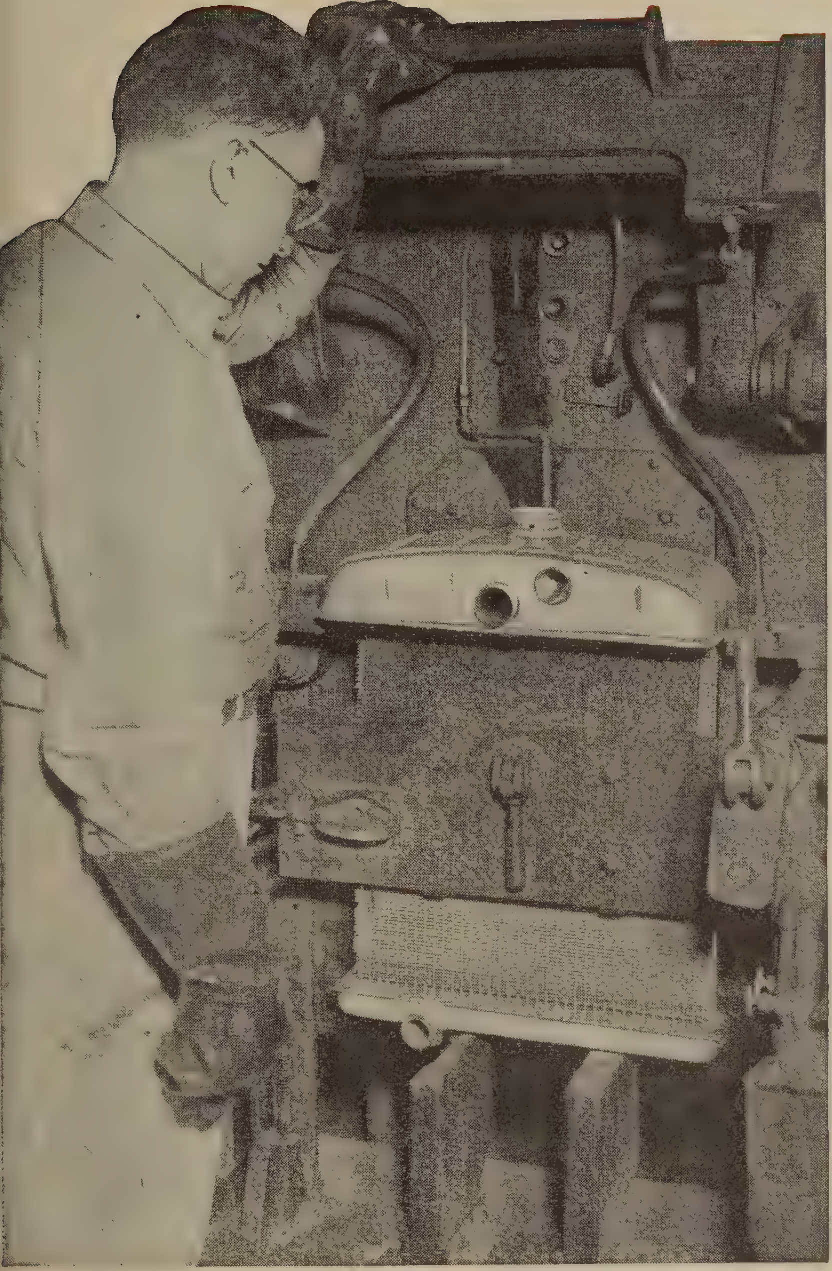
According to authoritativ sources, this fleet of 20 is the forerunner of several hundred destine for the Pacific Coast. There is considerable reason to believe that larger percentage of this contingen will be delivered to Seattle tha has heretofore been the case. Mos of these ships are being brought i from the Pacific war theatre unde their own power and some are to b disposed of for re-use or scrappin as the purchaser wishes. Other will go on the block with the stipulation that they must be scrapped

According to the best informatio available at this time, those LST' which are still considered serviceable will sell for approximatel $75,000 each. Those designated fo scrapping only reportedly will se for not more than $15,000. Eac ship is expected to produce abou 1200 tons of clean scrap meta However, this metal is only a sma part of the resale or salvage valu since the ships have two 900 h diesels (General Electric), plu numerous generators, small powe packs, beds, galley material, et They are completely furnished an include such details as field glasse

LST's develop a large percentag of salvageable metal, about the onl exceptions being a wooden choppin block in the galley and a plasti toilet seat.

While some scrap dealers hav been fearful that they might b squeezed out of the scrap busines

IH cuts soldering cost 58% with TOCCO Induction Heating



INTERNATIONAL HARVESTER COMPANY, world-famous builder of farm implements and automotive equipment, reports the following benefits from TOCCO Induction Soldering of radiator tanks to core:

CUTS COST 9¢ EACH

Former hand method cost 16.3¢ each for medium size radiator. TOCCO soldering costs 6.85¢ each, saving 58% on this operation.

IMPROVES QUALITY

TOCCO's automatically controlled heat melts uniform solder ring at 400° F . . . makes every joint perfect. Eliminates rejects. Improves service in field.

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Operator simply loads and unloads fixture. TOCCO eliminates fatigue, heat and fumes.

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through buys made by scrap users directly from the government, the more optimistic feel that the bidding for the ships will be hot and heavy between the scrap users and the dealers because of the high value of salvageable material over and above steel scrap to be procured from each ship.

With the LST's arriving here, there is considerable belief that the present $24 to $26.50 per ton price for steel scrap is due for a break.

SALT LAKE CITY—The controversy over the sale of Geneva steel plant to U. S. Steel Corp. is being recalled here in connection with the disposal of the Kalunite plant, as many of the same factors are involved.

The American Potash & Chemical Co. of New York has offered to purchase the plant, which was a wartime experiment in alumina production and which WAA has long regarded as a white elephant, for $752,000. This is $100,000 more than the valuation placed on the property by WAA. The company agrees also to spend an additional $750,000 converting the plant to the production of phosphate fertilizer.

Congressional representatives from Oregon and Washington want the government to throw this bid out on the grounds that American Potash is "Big Business" and accept an offer of $117,000 less from Columbia Metals Co. because it is "Little Business." The Columbia offer is contingent upon the government selling to the firm another wartime alumina plant at Salem, Ore., which is being operated under lease for fertilizer production.

Utah interests are reacting the same way they did to proposals that Geneva be used as a weapon in the cause of corporate, as well as geographical, decentralization. They are again more interested in supporting what looks like the surest and quickest way to get another going industry, than they are in encouraging small business which might or might not work out all right in the end. The state's congressional delegation, Gov. Herbert B. Maw and the Salt Lake City chamber of commerce are consequently backing the American Potash bid. All of which serves to reiterate the fact that the sociological theories written into the war surplus act are frequently more attractive at a distance than close-up.

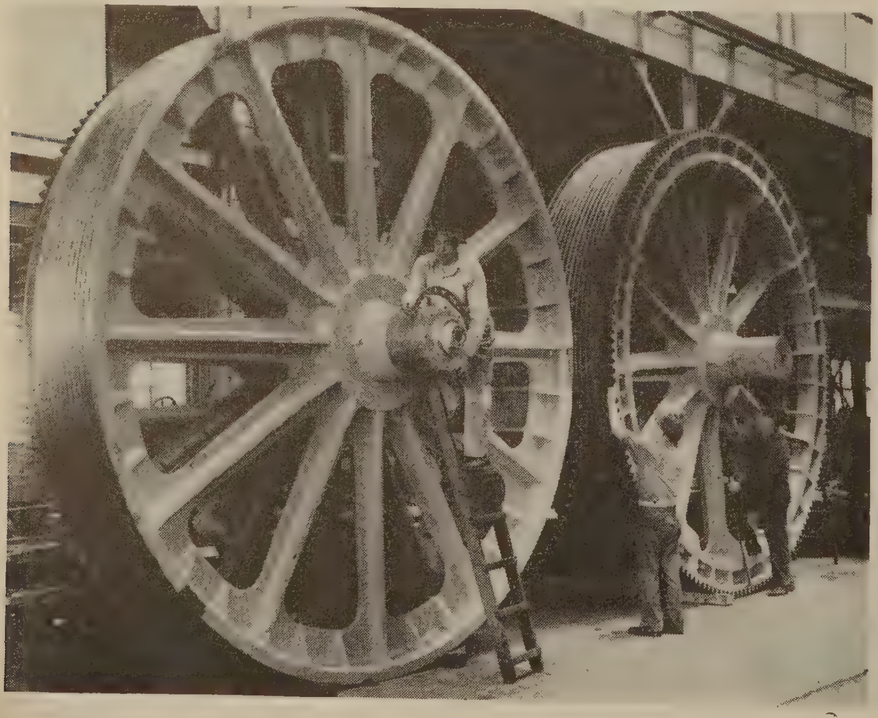
LOS ANGELES—Business activity in southern California has shown an exceptionally strong upward surge during recent months. Total factory employment in Los Angeles County has shown a substantial expansion. The 241,600 production workers employed in the manufacturing industries of the county in October compares with the postwar low of 229,800 last July. In marked contrast to the expansion currently taking place in most manufacturing lines is the contraction of employment at the aircraft plants—a trend which has been in evidence since early last spring. Even at present levels, however, employment in aircraft production locally is three times what it was in 1939, according to a survey recently released by the research department, Security First National Bank of Los Angeles.

New factories and major expansions of existing plants announced for Los Angeles County during the first 10 months of this year numbered 529 and will involve an estimated new investment of $112,800,000. During the same period last year, 546 new plants and expansions totaling $122,100,000 were announced. These totals far exceed anything previously recorded in peacetime. Largest plant on the October list of announcements was a $2 million mill for drawing small sized rods which will be added to the facilities of the Bethlehem Pacific Coast Steel Corp. A 50-ton electric furnace for the company is now approaching completion here.

Industrial power sales in southern California have established new peace-time records in each of the past three months. In fact, during October, electric power used for industrial purposes locally reached a level equal to that prevailing in the early months of 1945 while this country was still actively at war with both Germany and Japan.

Reflecting the general increase in business activity since midyear, unemployment in southern California has been declining rapidly. The number of persons in the area claiming unemployment payments has shown a sharper contraction in recent months than at any previous time in the postwar period to date. During the week ending October 30, the number of unemployment claimants totaled 106,500—down 35 pct from the 162,800 claimants reported three months earlier, the survey concluded.

LOTS OF PULL: *These two 28-ton pulley wheels, or sheaves, are undergoing final inspection in U. S. Steel's American Bridge Co. plant at Gary preparatory to shipment to Terminal Island, Calif., where they will become a part of the bridge across Cerritos Channel near Los Angeles. The wheels are to be part of the mechanism for lifting the spans of this 3-way bridge to permit the passage of ships through the channel.*



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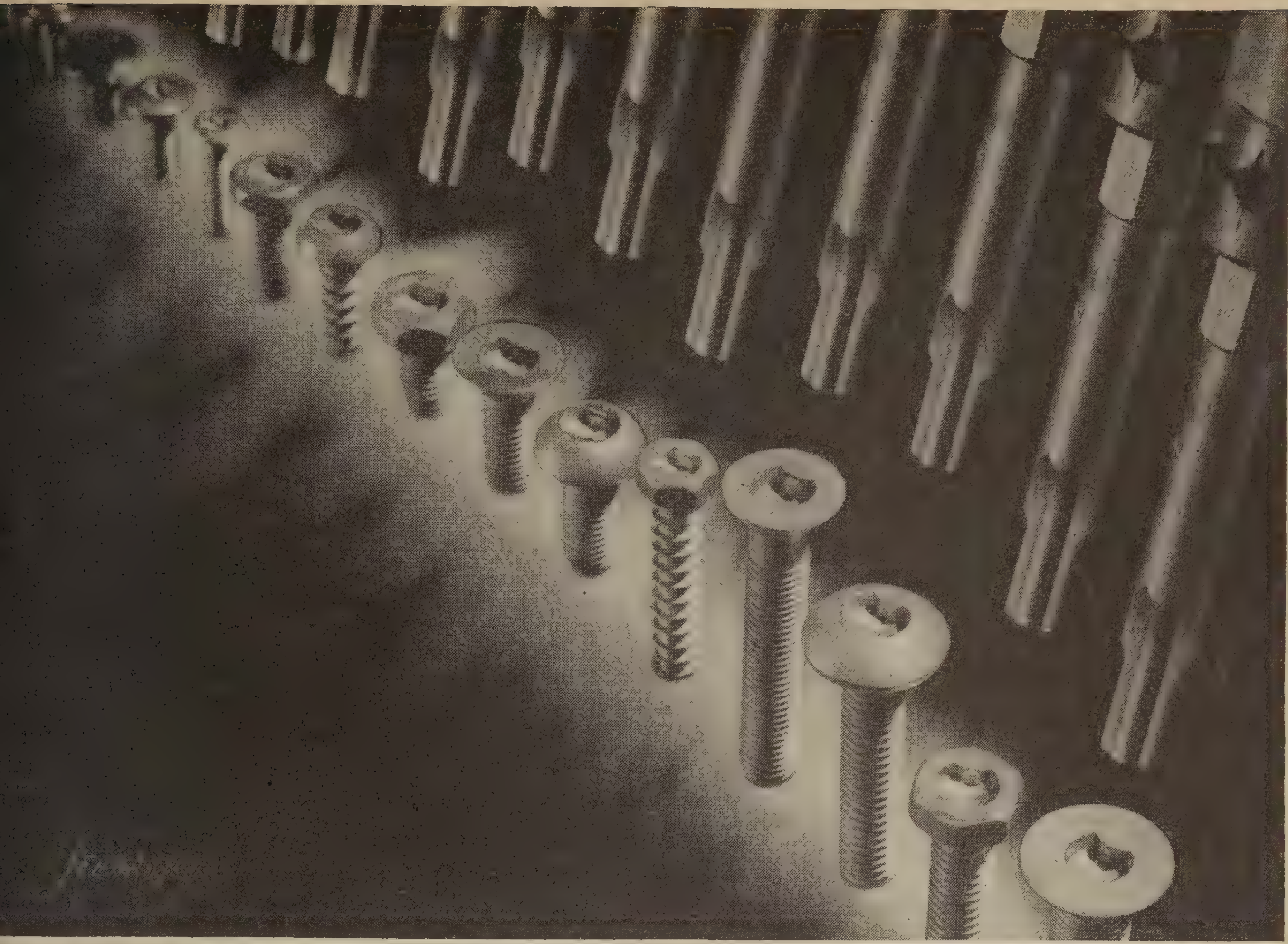

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CLUTCH HEAD *HURDLES ALL THE "FUMBLE SPOTS"* that retard speed and break the smoothness of operation through every phase of assembly...the logical result of these exclusive advantages combined in both screw and bit:

No Slow-down Hesitation	***The Clutch Recess Presents a Bold Target***
Deep Dead-Center Entry	***Makes Straight Driving Automatic***
No Driver Canting	***No Burred or "Chewed-up" Heads***
Non-Tapered Driving	***CLUTCH HEAD'S Engagement is All-square***
No "Ride-out" to Combat	***Rules Out the Skid Hazard***
No Exhausting End Pressure	***Disposes of a Fatigue Factor***
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The Extra Rugged Type "A" Bit	***Drives up to 214,000 Screws, Non-stop***
Repeated Bit Reconditioning	***A 60-Second, On-the-spot Operation***
Common Screwdriver Operation	***Exclusively a CLUTCH HEAD Feature***

Check these "fumble-spots" on your line and figure what their elimination would mean in terms of faster, safer, and lower cost production. CLUTCH HEAD *users have found output stepped up as much as 50%.*

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Washington . . .

EUGENE J. HARDY

• Large iron ore traffic for St. Lawrence Seaway forecast . . . Commerce sees water transportation of foreign ores as less costly than to beneficiation . . . Transportation costs analyzed . . . Labrador and Brazil most likely sources.

WASHINGTON—Proceeding on the assumption that "maintenance of the steel industry in the Great Lakes region apparently rests either on the development of a low-cost conversion process for the vast quantities of low-grade ore which exist in the Lake Superior region, or upon the availability of foreign ores delivered to the steel cities at relatively low cost," a recent Dept. of Commerce economic appraisal of the St. Lawrence Seaway Project indicates that "it is almost a certainty that a huge traffic in iron ore will develop" when the project is completed.

Commerce believes that the maximum volume of ore that could be handled by the Seaway as presently planned is somewhere between 30 million and 37.5 million tons annually, compared with the 80 to 90 million ton requirement of the lakes steel industry during good years.

Debate on the Seaway Project began back in 1897, when it was first declared feasible, and has continued intermittently throughout the years. It appears likely that Congress will take favorable action at the regular session which convenes next month. A resolution, backed by a bi-partisan group of Senators, is on the Senate calendar and is due to be debated early in the session. Hearings on a similar resolution have not been completed by the House Public Works Committee but it is planned to conclude them early in the regular session.

The current resolution is generally similar to earlier resolutions on the subject, but differs in one important respect, i.e., it would convert the venture from a public works project into a project which would be self-liquidating and self-supporting by means of toll charges. The toll charges could not exceed $1.25 per short ton.

About 90 pct of the Seaway is already complete. The canal system now in operation restricts navigation to small vessels of 14-ft maximum draft. The completed Seaway will establish a minimum depth of 27 ft over the entire 2347 mile route from Duluth to the Gulf of St. Lawrence.

Iron ore had not been previously emphasized in discussions of Seaway traffic, but depletion of high-grade iron ore reserves in the Lake Superior area has brought about the realization that ore might well be one of major items of traffic on the completed Seaway.

Pointing out the differences of opinion which exist regarding the extent of Lake Superior reserves of commercial iron ore and also the fact that the only alternative domestic source is the huge reserve of 63 billion tons of taconite, the Commerce study believes that within the next 20 years major steel producers in the Great Lakes area will find themselves greatly dependent on foreign ores.

Using as a primary reference THE IRON AGE article on the Reserve Mining Company's beneficiation plant (August 14, p. 110), the Commerce study states that there has been no evidence presented to indicate that "an economical conversion process is in prospect."

"The very fact that the companies interested in developing the beneficiation of low-grade Superior ore oppose the Seaway, because it would facilitate importation of low-cost foreign ores, is itself an indication that the industry doubts whether ore made from taconite can compete with low-cost foreign ores shipped in through the Seaway," according to Commerce.

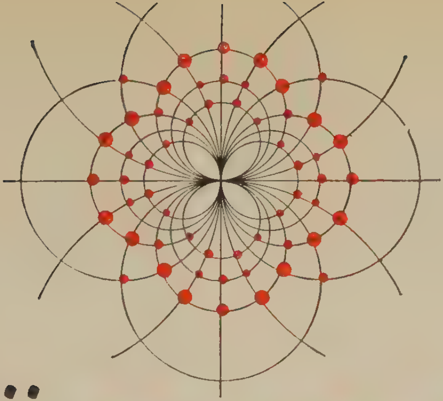
The deposits which seem to offer the most promise for shipment through the Seaway to the Great Lakes area are the high-grade open-pit ores in Labrador and Brazil.

As to the capacity of the projected Seaway for handling large quantities of these ores, the Commerce study emphasizes that the capacity is limited by the capacity of the Welland Canal locks, which, for a navigation season of 240 days, can handle about 6800 large vessel passages—3400 in each direction.

Since the Seaway will handle other types of traffic, it is estimated that the maximum number of ore boats which the Welland Canal can be expected to handle is probably in the neighborhood of 2000 and not in excess of 2500.

If the Labrador deposits are used extensively, the type of ore carriers utilizing the Seaway will be vessels comparable to the present lake carriers. Accordingly, the volume of ore which could be handled in from 2000 to 2500 vessel passages ranges from 30 million to 37.5 million tons, provided the largest type ore carriers—handling upwards of 15,000 tons, are used.

The Commerce study also covers, in some detail, the relative cost of water transportation of delivering ore to Lake Erie ports from Labrador and Brazil. In the case of the Labrador deposits, a railroad is planned which would terminate near Seven Islands on the Gulf of St. Lawrence. By utilizing this railway, Commerce estimates that fully loaded ore boats (15,000 tons plus) could make a round trip from Seven Islands to Cleveland (2040 miles) in about 10 days, including loading and unloading, at an actual cost of $1 to $1.20 per ton for water transportation. Including the ex-



It isn't the magnesia...

..IT'S THE PERICLASE

BASIC FURNACE

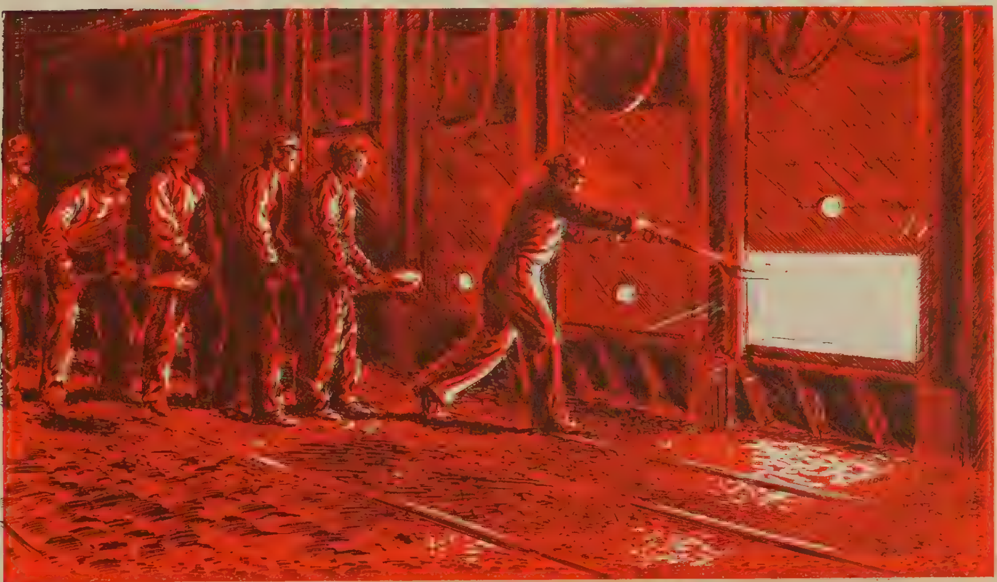
REFRACTORIES

MAGNESIA has long been considered as the most valuable component of a hearth refractory. Actually it is not magnesia by chemical analysis, but periclase, the crystalline form of magnesia, which provides the high resistance to erosion that steelmakers require.

Conventional grain magnesites have a high magnesia content, but require the addition of large amounts of open hearth slag to permit sintering. Installation is slow, laborious and expensive. Periclase content of the completed hearth is diluted by the large, unevenly distributed slag additions.

Basifrit, the original "quick setting" magnesite, eliminates these deficiencies. Its composition includes a refractory calcium silicate bond and a coalescing agent, calcium ferrite. Calcium silicate is compatible with the usual lime-rich slags encountered in the basic steelmaking process, and calcium ferrite, formed in Basifrit during manufacture, permits the refractory to set rapidly at normal furnace operating temperatures.

As a result of these designed properties, a Basifrit hearth takes but half the time required to install a conventional magnesite-and-slag hearth. All the magnesia in Basifrit is in the form of periclase, the key factor responsible for the excellent performance of Basifrit hearths, scores of which are still in use after 15 to 20 years of service.



Basic Refractories Incorporated **845 HANNA BUILDING, CLEVELAND 15, OHIO**

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., *Hamilton and Montreal* isting unloading charge of 18¢ absorbed by the vessels, a rate of from $1.20 to $1.40 would be possible, which it is claimed is not significantly higher than the present rate for ore shipments from the head of the Lakes to Lake Erie ports.

Brazilian ore presents a different problem and considerably higher transportation charges. Commerce states that in a movement of this character it would probably be necessary to trans-ship the ore at Montreal or some other St. Lawrence River port, since the depth limitations of the Seaway are such that very large ore carriers would be unable to carry full loads. For example, the Bethlehem Steel Company's large ore carriers draw about 34 ft of water, considerably more than would be possible for successful use through the Seaway.

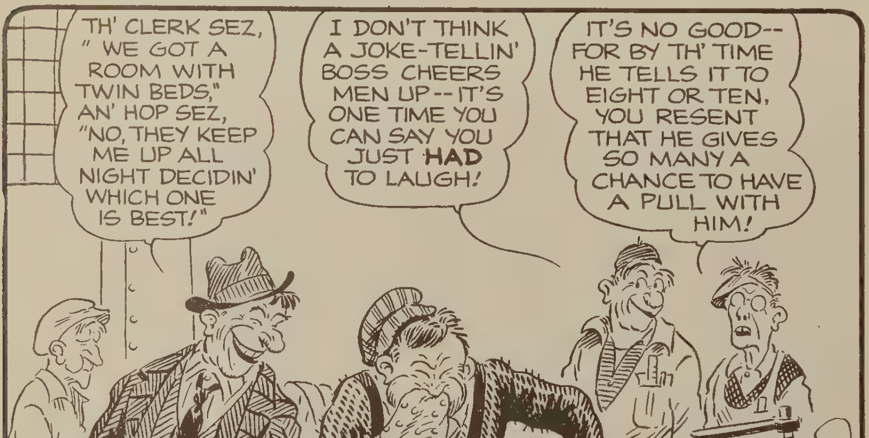
Commerce estimates that shipment from Brazilian ports to Montreal would involve a total cost ranging between $2.30 and $2.80 per ton. Transfer costs would probably range somewhere between 30 and 50¢ per ton. Transportation costs from Montreal to Cleveland are estimated at 60 to 70¢ per ton. Therefore, delivered costs on South American ore at Lake Erie ports, exclusive of Seaway tolls, would be from $1.15 to $1.50 higher than delivered costs at Atlantic ports, such as Baltimore.

If Brazilian ore is used, Commerce anticipates movement of ore from Atlantic ports to the Pittsburgh area by rail, since this rate is slightly less than the combined cost of the longer haul to Montreal, the trans-shipment charge, the water haul to Cleveland and the rail haul from Cleveland to Pittsburgh.

It is claimed, however, that "steel plants located at the lake cities would still find it advantageous to utilize the Seaway rather than to haul ore westward by rail, since the total additional water charge would be much less than the cost of rail transport from the coast."

Finally Commerce points out that its analysis of transportation costs is based on the most uneconomical operation possible and that if "substantial return cargo of coal or grain were available for either lake or ocean carriers, or both the transportation charges for ore would be greatly reduced. If return cargoes were assured in every case, the ore transport costs might be reduced by as much as 40 pct and the advantages of using the Seaway would be correspondingly increased."

THE BULL OF THE WOODS BY J. R. WILLIAMS


TH' CLERK SEZ, " WE GOT A ROOM WITH TWIN BEDS," AN' HOP SEZ, "NO, THEY KEEP ME UP ALL NIGHT DECIDIN' WHICH ONE IS BEST!"
I DON'T THINK A JOKE-TELLIN' BOSS CHEERS MEN UP--IT'S ONE TIME YOU CAN SAY YOU JUST HAD TO LAUGH!
IT'S NO GOOD-- FOR BY TH' TIME HE TELLS IT TO EIGHT OR TEN, YOU RESENT THAT HE GIVES SO MANY A CHANCE TO HAVE A PULL WITH HIM!
12-5 J.R.WILLIAMS
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THE SPREADING CHESTNUT 12-5

1948 Construction Estimated at 20 Pct Beyond 1947 Record

Washington

• • • **Government agencies** this week estimated that new construction in 1948 will rise at least 20 pct above 1947 levels to reach a new peak of more than $15 billion. This will result in a new high of 2.1 million in employment of construction workers by next September, it was estimated.

Residential construction will continue to increase while industrial building will decrease, John L. Haynes of the Office of Business Economics said in releasing the joint estimate of the Commerce and Labor Depts.

About three-fourths of the estimated 1948 total, or about $11.4 billion, will be privately financed, it was forecast, while the remaining $3.8 billion will be put in place with backing of public funds.

More than $6 billion of the total construction costs will be invested in residential building (exclusive of farm type which is estimated at half a billion more, a 10 pct increase). This represents 950,000 starts for new homes; completions should reach about 985,000 units. These figures are now considered as on the conservative side, officials said.

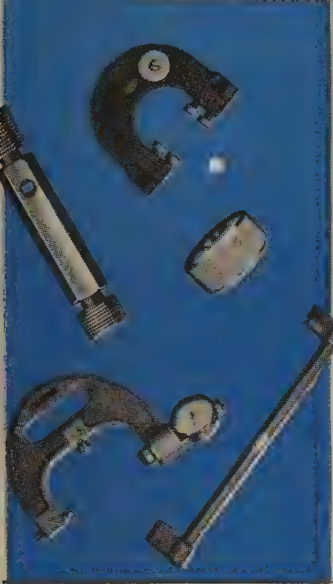
Industrial building is expected to drop some $350 million for a 1948 total of $1.3 billion. On the other hand, warehouse, office, store, garage and similar business construction is expected to advance from $880 million in 1947 to more than $1.1 billion next year.

Public utility expansion is expected to continue throughout next year with estimated expenditures predicted as rising from $1.3 billion this year to $1.6 billion in 1948.

Largest proportional jump is expected to take place in hospital and institutional building which is forecast as rising from the current $75 million rate to at least $225 million. Military construction will rise from $195 million to about $250 million.

Publicly financed residential housing will drop from the present $175 million rate to less than $100 million.

The Backbone of Cost Saving Dimensional Control



If you are manufacturing mechanical elements, close dimensional control will save you assembly time because accurately sized parts fit together quickly. Applied directly at the machine, proper gages save you scrap losses and much machine time. When all the elements of a mechanical assembly are held accurately within tolerance, that assembly gives superior performance in service.

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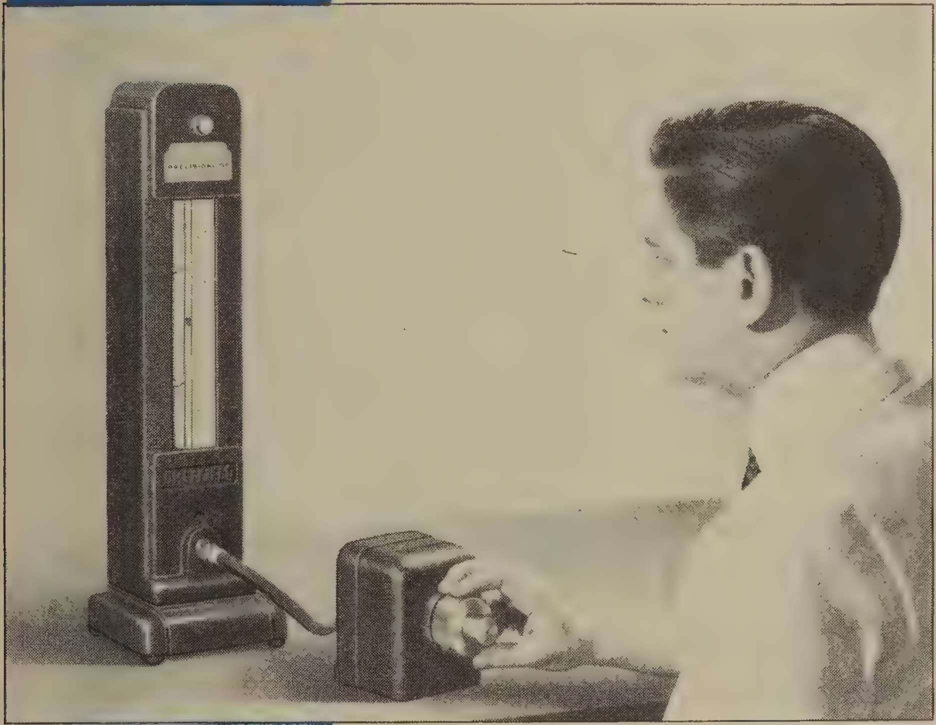
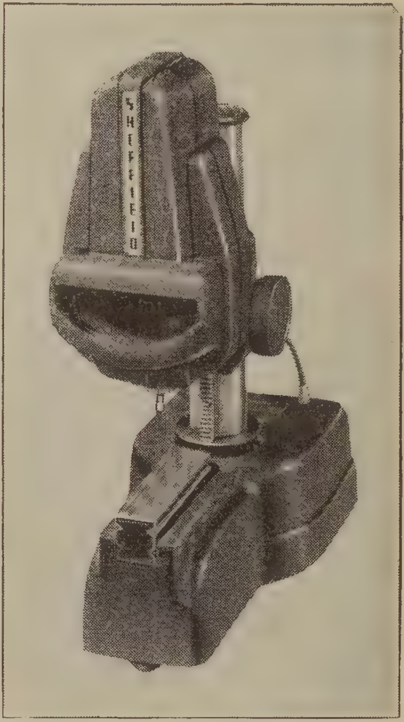
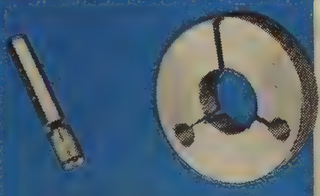
THE VISUAL GAGE is an indicating comparator set by means of precision gage blocks for checking external dimensions, the angularity of surfaces, the angularity between a bore and a surface, run-out, and the pitch diameter of screw threads. It is both a production and a tool room instrument. Write for catalog.







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HARRY D. MYERS, executive vice-president, director and general manager, Standard Products Co.

• **Harry D. Myers** has been appointed to the position of executive vice-president, director and general manager of the eight plants of the Standard Products Co., Detroit. Mr. Myers comes to the Standard Products Co. from the position of vice-president in charge of production and director with Harry Ferguson, Inc., also of Detroit.

• **George H. Todd** has been appointed assistant to the general superintendent of the Ashland Div., American Rolling Mill Co., Middletown, Ohio. **Paul G. Sammet** has been named openhearth superintendent, succeeding Mr. Todd in that capacity, and **William O. Richmond** has been named assistant superintendent of the openhearth department, succeeding Mr. Sammet. Mr. Richmond was formerly general foreman in the blast furnace department.

• **John A. Deitrich** has been appointed manager of the alloy tube division, Carpenter Steel Co., Union, N. J. He replaces the former manager, **E. W. Bachman,** who will continue to work with the alloy tube division in an advisory capacity.

• **Lachlan Mackenzie** has been elected executive vice-president of Eastern Stainless Steel Corp., Baltimore. Mr. Mackenzie has formerly served as assistant to the president and vice-president.

PERSONALS

○ ○ ○

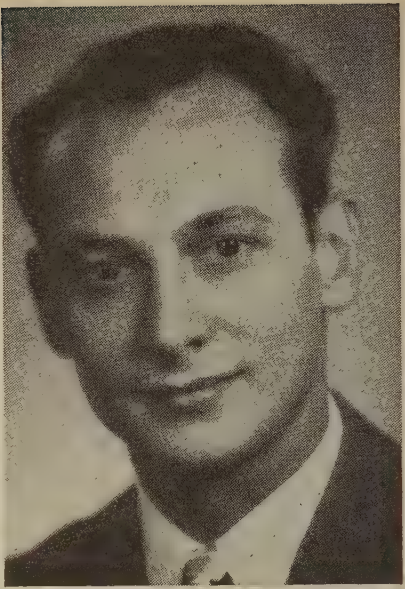
• **Raymond W. Drake** has been appointed manager of sales, Wilkes-Barre, Pa., sales office, American Steel & Wire Co. Mr. Drake has been connected with the American Steel & Wire Co. for 10 years, starting in the company's Trenton works as a clerk. He later became division supervisor of production planning, and in 1943 he transferred to the company's sales department and was assigned to the Wilkes-Barre office. As manager of sales at Wilkes-Barre he succeeds **Bruce D. Bennett,** who has been transferred to Chicago as manager of electrical wire rope and construction materials sales in the company's offices there.

• **Leonard C. Rose** has been named director of purchases for all divisions of Colorado Fuel & Iron Corp., Denver. Mr. Rose formerly was director of purchases for the Colorado Div. of the company only, and has been associated with CF&I since 1929.

• **George H. Lynn** has resigned from the Axelson Mfg. Co., Los Angeles. Mr. Lynn, for 8 years Washington lathe sales representative for the Axelson company, has accepted the position of western division sales manager with Niles Tool Works, and will be headquartered in Chicago.

• **Charles F. Devereaux,** formerly assistant zone manager at Buffalo for Pontiac Motor Div., succeeds **R. O. Nenke** as Washington zone manager. Mr. Nenke has resigned to become a Pontiac dealer at Bethesda, Md. **C. G. Miller,** assistant zone manager at New York, becomes zone manager at Philadelphia, succeeding **G. M. Powers, Jr.,** who has taken over a Pontiac dealership at Taunton, Mass.

• **Charles E. Weeks** has been appointed assistant to the operating vice-president of Southern Alkali Corp. He has been associated with Southern Alkali since 1934. Prior to this appointment, Mr. Weeks had served as auditor. His headquarters will be at the Southern Alkali plant, Corpus Christi.



FRANCIS J. SEHN, sales engineer, E. W. Bliss Co.

• **Francis J. Sehn** has been appointed sales engineer for E. W. Bliss Co. Mr. Sehn will service stamping manufacturers in the Detroit area. Prior to this appointment, he was chief die engineer for Fisher Body Tank Div., and more recently assistant master mechanic for Bliss.

• **Norton P. Bosemer** has been placed in charge of the Los Angeles office of Tube Turns, Inc., and **Robert S. Tyler, Jr.,** has been placed in charge of a newly-established midcontinent district, with headquarters at Tulsa. Mr. Bosemer joined Tube Turns sales staff in 1937, and was assignd to the San Francisco office in 1944. Mr. Tyler became associated with Tube Turns in 1946, after 4 years of service with the Navy.

• **J. Mathes,** formerly superintendent of sales service of the National Tube Co.'s Ellwood City, Pa., plant, has resigned to assume duties as president of the Erie Steel Treating & Metallurgical Co. at Erie, Pa.

• **S. C. Read** has been appointed manager of maintenance of Jones & Laughlin Steel Corp., Pittsburgh. Mr. Read started to work for the corporation in 1924, and in 1938 he was made master mechanic of rolling mills, Pittsburgh works. In 1946 he was appointed superintendent of blooming department and rolling mills, in which position he served until his current promotion.

Wilbur J. Artner has been dded to the staff of Horizons, ıc., in the Cleveland laboratory. rior to his service in the Navy, e spent 2 years with Pan Ameri- an.

H. R. McKean has been ap- ointed general superintendent; . **B. Dunn,** production manager; . **F. Brand,** manager of engineer- ıg, and **H. F. McRell,** manager of ales of General Electric Co.'s ansformer and allied product ivisions, Schenectady. All the ıen have been associated with E's transformer business. Mr. IcKean was assistant general uperintendent of manufacturing t the Pittsfield works; Mr. Dunn as assistant production manager f the works, and Mr. Brand was orks engineer. Mr. McRell was ıanager of the old transformer ivision.

William W. Scull has been amed general manager of manu- acturing services of the B. F. oodrich Co., Akron, Ohio. Mr. cull had been production man- ger of plants of B. F. Goodrich hemical Co. for the last 2 years. Ie joined B. F. Goodrich in 1929.

Joseph M. Brennan has been ppointed general manager of the rop forge division, and **George F. luth,** director of manufacturing acilities and methods of Willys- verland Motors, Toledo. **J. M. utler** assumes the duties of as- istant to Mr. Brennan. Before oining Willys-Overland as direc- or of works operations, Mr. Bren- an had been with General Motors or 20 years. Prior to his present ppointment, Mr. Bluth served uccessively as assistant general hief inspector, general chief in- pector, assistant works manager, nd then works manager at Willys- verland.

Arnold M. Lenz has been ap- ointed executive assistant to the eneral manager in charge of all ıanufacturing of Pontiac Motor iv., General Motors Corp., Pon- iac, Mich. Most recently with he Chevrolet Div. as general ıanufacturing manager of its leveland division, he started out ith Buick in 1916, going to hevrolet in 1919, where he re- ıained until appointed to his pres- nt position.

CALVERT CAREY (left), president, and FRED DUNNING (right), executive vice-president, Yale & Towne Mfg. Co.

- **Calvert Carey** has been elected president of the Yale & Towne Mfg. Co., New York, succeeding the late W. Gibson Carey, Jr. **Fred Dunning** has been elected executive vice-president of the company, and will also continue to serve as secretary and treasurer. Mr. Carey was vice-president in charge of manufacture since 1943. Both men have been serving as directors of the corporation for many years.

- **Edward E. Lewis,** executive vice-president of the Colonial Radio Corp., Buffalo, has been elected president of the company. He succeeds **Don G. Mitchell,** president of the parent company, Sylvania Electric Products, Inc., who had been serving in a temporary capacity since the resignation of Allen H. Gardner.

- **Ernest L. Gartner,** manager of the metal and ore division of E. I. du Pont de Nemours & Co. Grasselli chemicals department, Wilmington, has retired after 43 years with the company.

- **Clifford B. Mueller** has been elected manager of the manufacturing sales division of the Schaible Co., Cincinnati, following the resignation of **S. A. Mullikin.** Mr. Mueller has been with Schaible for some time, and prior to his recent service in the Army, he did market research and sales promoting for the company.

- **Edward K. Davis,** director and president of Aluminium, Ltd., Montreal, since its organization in 1928, has resigned, and **Nathanael V. Davis** has been elected new director and president. Nathanael Davis joined Aluminium, Ltd., in 1939 and, except for service in the U. S. Naval Air Force, has been continuously associated with subsidiary companies.

- **H. H. Michelsen** has been appointed district manager for Combustion Engineering Co., Inc., in Cincinnati.

- **James M. Brophy, Jr.,** former assistant purchasing agent for the Blackhawk Mfg. Co., Milwaukee, has been appointed purchasing agent. He joined Blackhawk in 1945 as a buyer.

- **James C. Esterline** has been appointed general manager of the L.G.S. Spring Clutch Corp. of Indianapolis, a division of Curtiss-Wright Corp. Mr. Esterline was formerly affiliated with the American Blower Corp. and served 10 years in sales and engineering capacities.

- **Herbert C. Behrens,** assistant chief engineer of Diebold, Inc., Canton, Ohio, has been promoted to the position of chief engineer responsible for product design and development, product standards, sales order engineering and inspection.

• **F. H. Craton,** former assistant manager of the transportation division of General Electric Co., has been appointed manager of sales of the locomotive and car equipment divisions of the apparatus department at Erie, Pa. **H. W. Gouldthorpe,** former Erie works engineer, has been made manager of engineering; **David Blair,** former production manager of the Erie works, is production manager; **D. A. Smith,** former assistant works accountant, is accountant, and **H. O. Trumpfheller,** former assistant to the manager of apparatus manufacturing at Erie, has been made assistant to the manager-manufacturing, locomotive and car equipment divisions.

• **Allan Weber** has been appointed special railroad representative in the eastern United States for Goodyear Tire & Rubber Co., Akron, Ohio. With headquarters in New York, Mr. Weber's assignment covers railroads on the east coast and as far west as Cleveland. He succeeds R. B. Warren, who was recently named Pittsburgh district manager for Goodyear's mechanical goods division. Mr. Weber joined Goodyear in 1927.

• **Frank A. DeWitt** has been appointed to the newly-created post of director of research for Justowriter Corp., Rochester, subsidiary of Commercial Controls Corp. Since 1938, Mr. DeWitt has been an instructor in the department of publishing and printing at the Rochester Institute of Technology.

• **E. L. Ramsey** has been appointed a technical consultant for Miller & Co., Chicago. Mr. Ramsey retired in May as superintendent of steel production for Wisconsin Steel Co. after 25 years with that company. He formerly had been connected with U. S. Steel Corp., Republic Steel Corp. and Mesta Machine Co., before becoming associated with Wisconsin Steel Co.

• **Edward J. Deisley,** executive engineer of the Budd Co., Philadelphia, has been appointed special sales representative with residence in Detroit.

THOMAS G. CAREY, **purchasing agent of production parts and subcontracting, Weatherhead Co.**

• **Thomas G. Carey** has been advanced to the position of purchasing agent of production parts and subcontracting by the Weatherhead Co. of Cleveland. Mr. Carey has been in the employ of Weatherhead for the past 2 years in its production section and previously held an administrative position with the Chicago Ordnance District of the War Dept.

• **Joseph B. Overman,** former chief of planning for the treasury department at Willys-Overland Motors, Toledo, has been appointed assistant to the treasurer and will assume the duties of **A. E. Barton,** resigned. **R. R. Hessler** will assume the duties of chief, treasury planning. Mr. Overman, before becoming associated with Willys-Overland, was with the Dura Co., the American National Co. and the Gerity-Adrian Mfg. Corp.

• **A. B. Chauncy** has been appointed a representative in Connecticut with headquarters at West Hartford for Apex Alkali Products Co.

• **Robert B. Franklin** has been appointed manager of the Ipswich, Mass., fixture plant of Sylvania Electric Products, Inc. He previously held the positions of manufacturing superintendent and production control supervisor.

• **David G. Henderson** has bee appointed sales engineer in t Pittsburgh area for the Hannif Corp., Chicago.

• **Clyde A. Sluhan,** for sever years Connecticut salesman of t Anderson Oil Co. of Portlan Conn., has been appointed ma ager of industrial sales.

• **J. C. Elmburg,** manager Fairbanks, Morse & Co.'s Bosto branch house, has been tran ferred to the company's Atlan branch house to assume the pos tion of manager of that area. replaces **G. N. Van Epps,** who ha resigned. **V. O. Harkness,** wh has been manager of the dies division at Chicago headquarter has been appointed manager the Boston branch and **T. M. Rob** of Chicago has been appointed the position of manager of t general diesel sales division.

• **Douglas P. Waterhouse** h been appointed northeastern di trict representative for Gener Electric Co. accessory equipmen Boston. Mr. Waterhouse joine the company's accessory equi ment and wiring device divisio last year.

OBITUARY...

• **Howard F. Parkerton, Sr.,** 6 manager of the Farrel-Birmin ham Co., Inc., sales office at L Angeles, died Oct. 27.

• **Bradford Foote, Sr.** died recen ly after a short illness. He w president and treasurer of t Brad Foote Gear Works, In Cicero, Ill.

• **Max A. Berns,** publicity ma ager of the Universal Atlas C ment Co., New York, subsidiary U. S. Steel Corp., died sudden Nov. 19.

• **Harry Fagin,** 59, vice-preside of Chapin & Fagin, Inc., Buffal for the last 18 years, died Nov. 1

• **William Keller,** 63, former pres dent of the National Bronze Fou dry, Springfield, Mass., died No 13.

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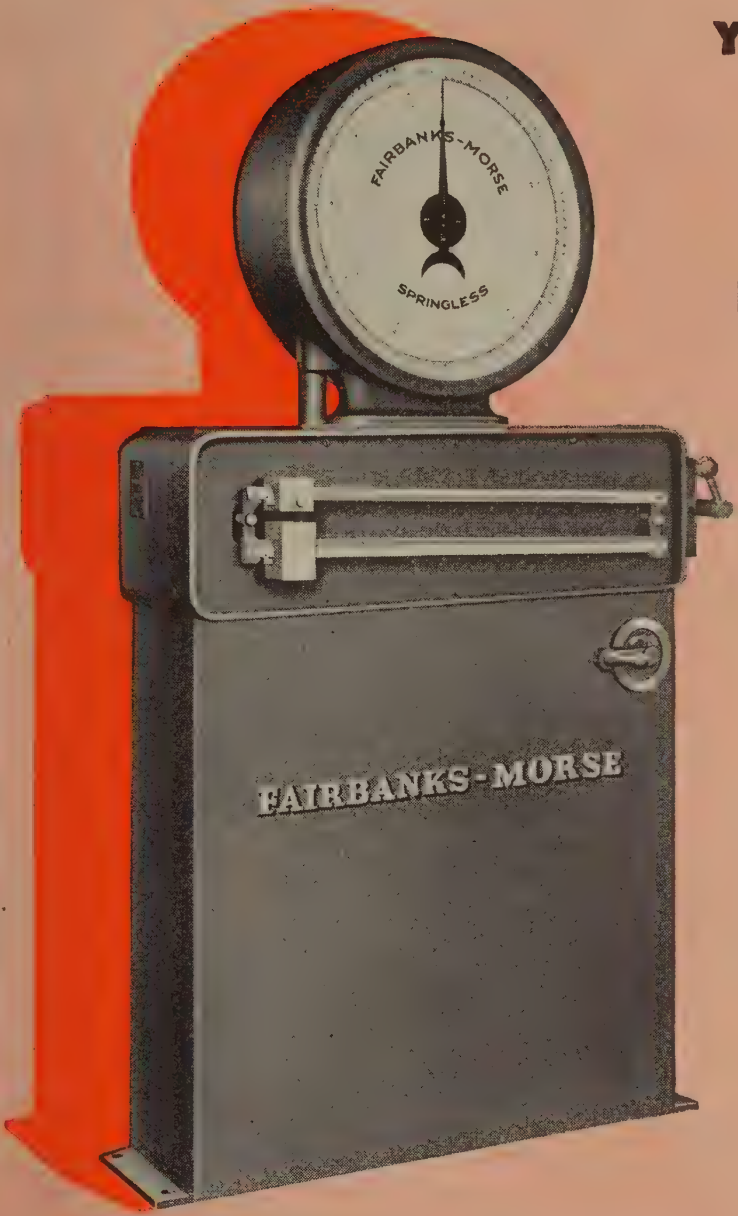

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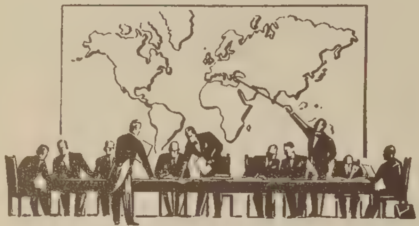

LONDON—If the events of the last 9 months have proved anything about international politics, it is that neither the Soviet nor the American government wants war. The opportunities to start war, or to issue the kind of challenges that lead to war, have been lavishly presented. There have been maneuverings for strategic position, interventions in the business of neighbors, exchanges of threats and discourtesies, appeals to passion and prejudice sufficient to provide fuel for a conflagration.

The pile of fuel has grown higher and higher, until Americans and Russians can hardly see one another over the top. But still there has been no one willing to strike a match. Why, then, is there still so much talk of war in Europe? Why can Budapest be seized with panic for 48 hours at the rumor that war has started?

Disappointment has played a large part in the creation of this mood, disappointment that Great Power unity has been proved an illusion and that power politics have been with us all the time. Hope, too, has played its part, the hope of the discredited quislings and reactionaries of Europe that America's decision to stay in Europe means for them a new lease of life.

Fear has played an even greater part, fear lest a Power with so mighty a weapon as the atom bomb might take the short cut to world domination, becoming suddenly arrogant in its youth and inexperience. Publicity, too, has made its contribution, bringing the applause of mass audiences to the ears of statesmen who should have been negotiating instead of cheer-leading. And Soviet diplomatic methods have added their quota of exasperating stubbornness, puzzling tactlessness and one-track realism.

Yet to say all this is to make more inexplicable than ever the fact that tension has never been dangerous, and that there has not been an incident that had even the appearance of danger since Marshall Tito's men shot down an American aircraft in August 1946.

WHY—to use Mr. Lippmann's phrase—has the war stayed cold? The answer can be found by asking another question: Why, nowadays, do wars — large-scale wars between Great Powers—get started? In the old days, and even, perhaps, as late as 1914, wars could start almost by accident, because somebody's trigger-finger slipped, or because somebody was careless about smoking in a powder magazine. But it is hardly so today.

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The existence of the United Nations and the repeated demonstrations of the appalling risks of war, not least of its risk to the individuals who are in power when it begins, will be sufficient in future to prevent the purely accidental wars. War will break out only because some Great Power wants it. And a Great Power can want war for one of two reasons: Either because, like Hitler in 1939, it believes not only that it can get its way by war, but also that it can do so easily and quickly; or because it is so badly frightened by the warlike preparations of others that it decides to strike while it still has time.

The reason why there is no risk of war now is because no Great Power is either confident enough of the results of war or frightened enough of the consequences of peace. This is not to say that the Americans and the Russians are not pursuing diametrically opposite ends. But they are pursuing them, and will, at least in the short run, continue to pursue them, by nonwarlike means.

For 2 years—a short time by normal diplomatic standards—each has been marking out its sphere of influence in the no-man's-land left by the defeat of Germany and Japan, and by the weakness of Britain, France and China. Now the process is reaching its culmination, since the Foreign Ministers cannot any longer postpone the taking of decisions about Germany. The prospects of agreement are small; but there is no good reason why disagreement on this occasion should be any more catastrophic than on previous occasions.

IT is true that there are noisy warmongers in the United States and aggressively nervous persons in the Soviet Union. Each group plays on the fears and ambitions of the other. But there is no sign that their goverments, the handful of men in both countries who really decide policy, want war. They clearly prefer the "other means"—nowadays not formal diplomacy, but the use of money, goods, parties and ideas.

The struggle between these other means is now joined. The Zhdanov directive to Communist parties and the Marshall Plan for the western democracies will be in sharp conflict throughout the winter. Each is admirably calculated to test the other. But there is no evidence that the rulers of Soviet Russia intend to back their stake with war. They are neither sufficiently scornful nor sufficiently frightened of American military strength to run the risk. They know that if they started a war now, they might in the end win it or lose it, but it would certainly be a long, hard war—and that they dare not face. On the contrary, Russian policy, though offensive in tactics, is defensive in purpose and tone.

In the two chief scenes of struggle, France and Italy, it is evident that the new tactics of the Communist parties reflect an acceptance

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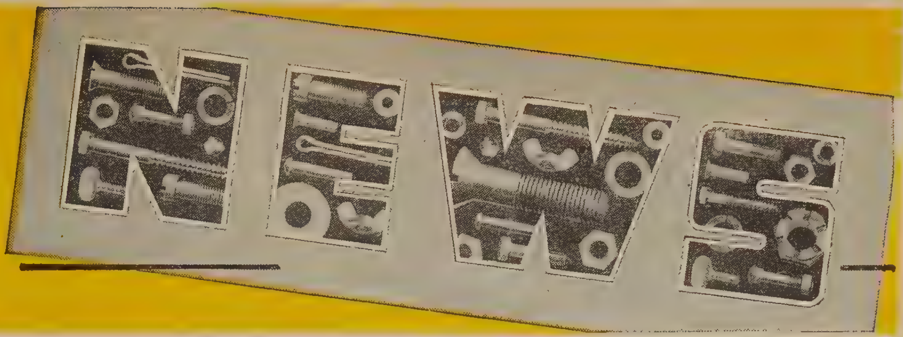

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of the fact that they will not gain power. As for American policy, those who think that it could ever lead to an unprovoked declaration of war are simply exhibiting their ignorance of America.

There is then no present risk of war. But what of the longer run? Unfortunately it is not sufficient to demonstrate the foolishness of the prophecies of imminent war. The pessimists will come back with the assertion that in the long run war between two aspirants to world power is inevitable. The case for this is twofold. First, it is argued that the Russian way of life and work and the American cannot live side by side; secondly, that Soviet expansion—as inevitable, for historical reasons, as Romanov ambitions—must come into direct conflict with American and British interests either in Europe, or in the Middle East, or, indeed, in the Far East.

It would be foolish to be very optimistic about the long-term prospects of peace. Mankind has never succeeded in keeping the peace for very long and the available evidence does not suggest that the present generation is so much more intelligent or fortunate in its circumstances that it will be able to succeed where all its forefathers failed. But this at least can be said, that no war ever has been inevitable, and that this particular one seems to be less inevitable than most.

Nowhere in Europe—nowhere probably in the world—is there a likelihood of straight Americanism and straight Communism growing up side by side. They will be separated by any number of strange and various compromises. Moreover, it is highly probable that re-equipment and technological progress in the west will go faster than in the east, so that what is by all odds the less aggressive system will have the material attraction and advantage.

IT is true enough that there will continue to be a severe conflict of interests, ideological, economic, political and territorial. If the prophets of woe would limit themselves to predicting that there will be no real peace, their case would be proved up to the hilt. But armed war will not break out unless the rulers of Russia—for the contingency of American aggression can really be ruled out—want it to break out; and that means, until they either think they can win quickly or they really become as badly frightened as their propagandists try to make them out to be.

It follows that the right long-term policy for the Anglo-Americans is to aim to produce a psychology in Moscow that is neither overconfident nor overfearful. To do that they must stand quite firm against encroachments, while rejecting no opportunity of proclaiming and demonstrating that their ultimate aim is agreement with the Russians and not their destruction.

Both halves of this policy are equally necessary. But at the moment it is, perhaps, the second that most needs re-emphasis. At the moment there is no doubt whatever about the strength and firmness of American determination or of the impressive backing that Mr. Marshall enjoys among his own people. So impressive is it that there may be some risk that the Russians, shut up in the Kremlin with their ideologies, their suspicions and their unfailing misunderstanding of all other countries, will begin to have some real fear of being overwhelmed by triumphant American policies.

It is not yet time to soften the American policy of firmness, or to talk about softening it. It has already produced results, and to produce the final result at which it is aiming, it will have to be kept up for many years to come. But there is nothing more dangerous, in diplomacy as in warfare, than the temptation to follow up a retreating enemy too fast and too far—particularly when he is a Russian.

IT is unlikely that there will be much opportunity for showing the other side of American policy round the conference table when Mr. Marshall and Mr. Molotov meet again in the one European capital where there is little serious talk of war. The discussions of the Foreign Ministers' Deputies have shown no sign that their masters will meet half-way. Indeed, the situation is now worse than it was in Moscow last March: It is very doubtful whether any agreement on the economic unification of Germany could now be executed without striking at the roots of the Marshall Plan, which is the major interest of three out of the four Ministers.

But if the Foreign Ministers Conference itself provides no opportunity for anything other than acrimonious disagreement, Mr. Marshall's visit to England may possibly do so. The great enterprise of the Marshall Plan was launched by a speech at Harvard—and Mr. Marshall is to receive an honorary degree at Oxford. He can ignore the wilder Communist attacks upon his motives and his good faith—he knows that he is under no necessity of answering them before British public opinion.

But he cannot afford to disregard the almost universal wish to know with more precision where the limits of American interest lie, and whether he really believes that security can be organized by the collective effort of the United Nations. Mr. Marshall would much strengthen his following in this country if he would use his visit to give a glimpse of his vision of the future.

There is then a special task for Mr. Marshall to perform in Britain, particularly in a Britain that has a Socialist government. There has been an enormous slump in the Russian stock in this country since the end of the war. But certain illusions die hard, and among them are the wishful thoughts that agreement with Russia will come quickly, that trade will establish links that diplomacy cannot forge, that the rulers of Russia feel an affinity to Social Democrats. These illusions cannot safely be left merely to wither away in the unfriendly atmosphere of events. Nor can the Left Wing's ideological suspicion of capitalist America be left to disappear under the impact of the Marshall Plan.

There is a much greater disposition in Britain today than there has ever been before to face all the implications of the view that the best way to be friends with Russia is to be firm, and to accept partnership with America in such an enterprise.

End German Coal Controls

London

• • • **Responsibility** for coal production and distribution in Germany was formally handed over to the Germans on November 19. The ceremony took place at the Villa Hugel, Essen, the former Krupp home. With the transfer, the North German Coal Control, established by the British in July 1945, ceases to exist.

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Industrial News Summary...

- ***Steel Control Seen Dangerous***
- ***No Need for It in Peacetimes***
- ***Freight Car Program Will Hurt***

CAPITULATION of Congress to the Government's demand for steel allocation powers would carry with it the power to destroy the present peacetime steel distribution setup. The current voluntary quota system in the steel industry has its weak points but it is based on practical applications and administered by those who realize the explosive character of the delicate balance between supply and demand.

Government officials apparently have no definite plans while they ask for allocation powers and have lost sight of the important fact that peacetime steel business is a far cry from wartime output. During the war, mills often ran for weeks on single orders for war goods. Super priorities completely eliminated hundreds of steel consumers from the general steel market. Production was aimed at high output of material for one purpose only—war.

Today the number of steel customers and the number of actual orders placed are far in excess of the normal war year. Individual steel orders call for different sizes, grades, tonnage, destinations and end uses. For any government or any company to attempt to determine the difference—if there is any—between essential and nonessential demand in peacetime could result in industrial suicide.

Great Britain has fallen into the trap of attempted peacetime allocation. It is going through the same process of allocation breakdown which occurred in this country during the early years of the war. Early this year the British Government set up allocations or priorities favoring steel demand for fuel, power and oil conversion uses. By the second quarter of this year such priorities earmarked the complete output of light plate production in Great Britain. Now, faced with the need for even higher priorities for the export drive, a whole new system is being planned.

ALREADY in this country this week there is complete evidence that voluntary allocation by the steel industry under extreme government pressure will upset the distribution applecart. The industry has promised to begin shipping early next year enough steel to build 15,000 freight cars a month. Such a program requires an extremely delicate balance between the necessary tonnages of plates, sheets, strip, castings, wheels and other component parts. This extra material can come from only one place—steel which would have gone to other steel consumers, many of whom consider their requirements to be just as important as railroad rolling stock.

Because of the enlarged freight car program practically all steel companies will be forced to slash quotas which have been set up for their customers in 1948. Cries are already being raised by steel customers who are looking ahead to such reductions in the shipments. If one major example of a voluntary allocation plan or a single industry carried on by governmental pressure can upset the current distribution picture, it takes little imagination to picture what would happen under a governmental peacetime allocation plan backed up by legislative power.

The Government has indicated that it would like to have allocation controls in order to eliminate the so-called gray market in steel. Such a demand is silly in the face of the fact that 96 pct of the total steel shipped today is at the so-called legitimate mill prices, which average $100 per ton or more under gray market prices. Furthermore, gray market steel supplies for the most part are derived from steel consumers themselves who have found it lucrative to dispose of steel inventories and steel shipments which they do not need at the present time. It is unlikely that, on the basis of governmental testimony before Congress, the latter will authorize steel allocations or steel price wage controls.

GREAT BRITAIN, which did more than any other country to aid and abet the creation of a Mar shall Plan, is going to get the worst possible results i aid for its own heavy industry. Short of scrap an raw steel, it now appears that the British demand fo this material is to be completely eliminated, bu finished steel might be shipped instead.

Latest data on the steel phase of the Marshal Plan indicate that the former program of 3.1 million tons of raw and finished steel a year in 1948 has been scaled down to 2.3 million tons, with the request fo raw steel only a small part of the total.

The Marshall Plan steel requirements will be part of the total export shipment which would ordi narily be made in 1948. If steel exports next year are about the same as this year they will probably tota between 5 and 5½ million tons. Of that amount prob ably no more than 1½ million tons would have bee slated for the 16 nations of the ERP.

The problem is to obtain the difference between 1½ million tons of steel which normally would go to 16 nations in the Marshall Plan had there been no plan, and the 2.3 million tons which is the latest setup for the recovery program. The difference represent about 800,000 tons or 1.2 pct of this year's steel pro duction. The net addition to steel exports during 194 because of the Marshall Program will represent no more than the equivalent of 1 million tons of steel ingots—a small amount on which to base the reques for peacetime controls over the basic steel industry

The steel operating rate this week reached a new peacetime peak when it went up 1½ points to 98 pc of capacity. THE IRON AGE steel scrap composite price this week is down 33¢ a gross ton to $40.25 per gros ton because of a decline in the Philadelphia market

• **CAN MAKING CUT**—The proposed ban by the Dept. of Commerce on metal cans for packaging of beer, coffee, pet foods and motor oils would accomplish negligible results, according to R. S. Solinsky, president of the Can Manufacturers Institute. Complete banning of all cans for the coffee, beer, pet food and motor oil industries and the consequent disruption of these businesses, would result in a saving of only 1 pct of the country's 1948 steel production. By the same token the total saving in tin consumption through such an order would be less than 2½ pct. While the estimated 1948 usage of steel for the products that would be affected by the order, would be 20 pct of the can manufacturers total usage, it would be only 1 pct of the estimated 70 million tons of steel to be produced in 1948. Likewise, he said, the savings of tin would approximate only 2145 tons out of the 88,300 tons estimated consumption by all industries in 1948.

• **SCRAP FROM GERMANY**—R. M. Shone, Economic Director of the British Iron & Steel Federation, has disclosed that the enthusiastic scrap recovery program the British officials have pursued wherever British jurisdiction has spread will result in the shipment of 1 million tons of scrap from Germany to the steel industry of the United Kingdom next year. He gave no information as to shipments this year, but it is believed that they are at least as high.

• **NORWEGIAN PIG IRON** — In the last few weeks Eastern Pennsylvania mills received shipments of 4300 tons of pig iron from Norway. Worth Steel Co. received 2000 tons last week, Lukens Steel Co. 2300 tons several weeks ago. It is understood that plate shipments for Norway from these producers have been made contingent on pig iron receipts here.

• **GEAR SALES**—The Gearing Industry shows an increase in volume of sales for October 1947, as compared with September 1947, of 1.33 pct. This report does not include turbine or propulsion gearing. The index figure for October 1947, was 456.

• **STATE DEPARTMENT DENIES**—Last week the State Dept. flatly denied charges that the program for dismantling German war plants would add to the cost of foreign aid from the United States or that the razing program would divert German labor and materials from productive or rehabilitation use.

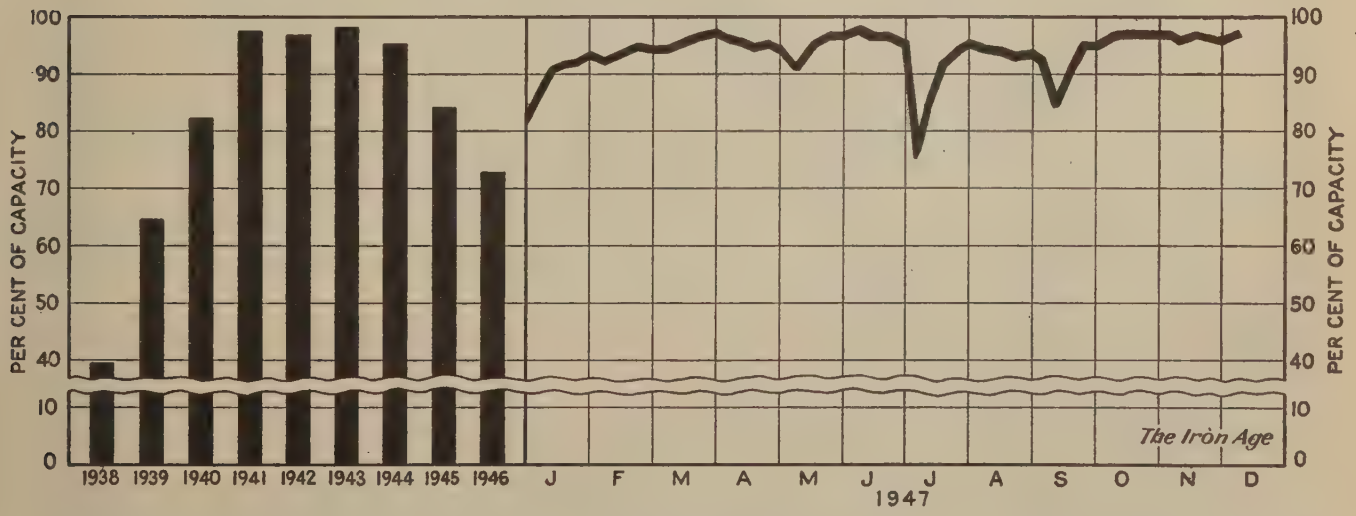
Plant removal activities, the Department said, are intended to transfer excess capacity from Germany to war-damaged nations. These plants could not be used by Germany in any event, it was added, because of worldwide shortages of raw materials which, it was forecast, "are likely to persist throughout the period of the European Recovery Program."

Furtherfore, the State Dept. said, the plants slated for removal are those which were built in connection with the German war machine and have been judged by both American and British authorities as having no use in rebuilding the peacetime economy of Germany.

• **WORK STOPPAGES DOWN**—Work stoppages in October continued the downward trend begun last April, according to the Labor Dept. which reports only 175 stoppages in the tenth month as compared with 200 in September. Including stoppages which were carried into October from September, the total aggregated 350 as compared with 516 for the same month in 1946. Total workers involved in all strikes in October amounted to 145,000; strike-bound workers in September totaled 370,000. At the same time, the Conciliation Service reports that it terminated 83 stoppages in October and at the same time adjusted 405 disputes before they reached the strike stage.

• **CUSTOMER HELP**—Republic Steel Corp. has made as high as 15,000 tons of carbon steel in electric furnaces, for customers who furnish the scrap, according to C. M. White, president, Republic Steel Corp., in a speech before members of the Pressed Metal Institute. Said Mr. White: "These people are customers of ours, and they pay us for performing this service. This is not the black market, or the gray market; these customers are short on their flat rolled requirements and are willing to pay the costs of such conversion to supplement their mill receipts."

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
November 25...	104.0*	95.5	92.5	95.0	99.0*	102.0	90.0	99.0	104.0*	107.5	98.5	80.0	94.0	96.5
December 2....	104.0	95.5	92.0	93.5	94.0	102.0	100.0	100.0	101.0	110.5	100.0	87.0	94.0	98.0

* Revised.

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by AMERICAN WELDING

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SAVING IN THE COST OF TOOLING

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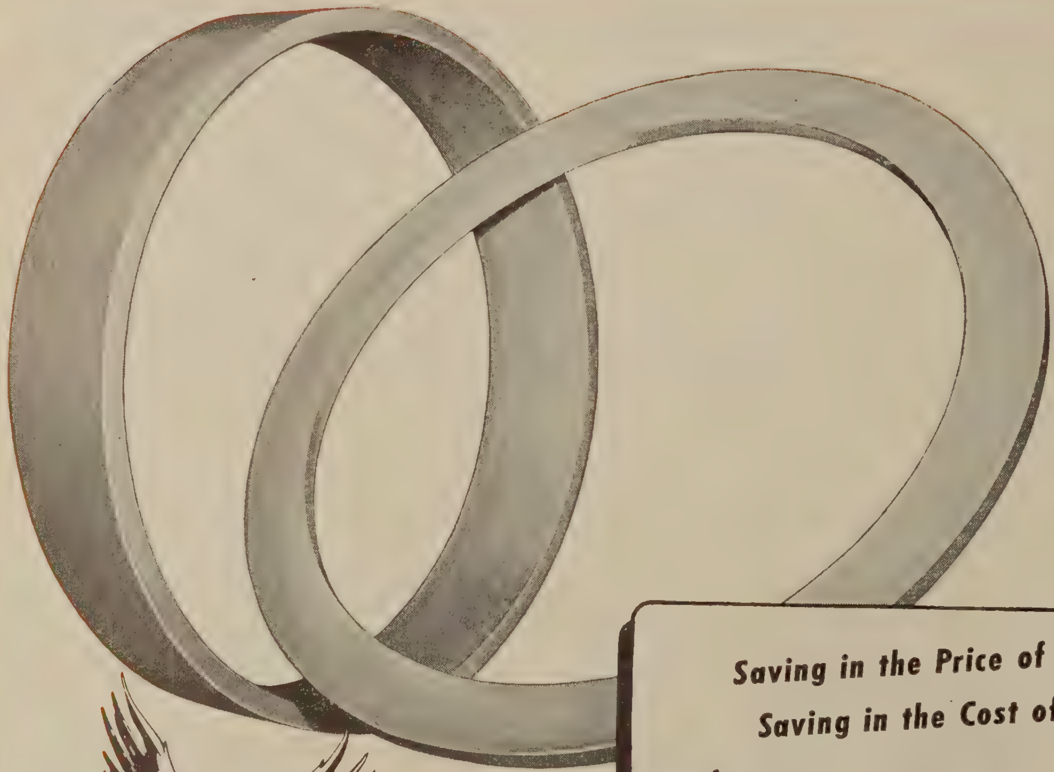
If you use stainless rings, or any other welded product, a few moments spent with our representative may prove to be very advantageous. May we hear from you?



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Saving in the Cost of Tooling
with **WELDED** *Stainless Rings*

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Reshuffling Steel Exports Alarms Both Exporters and State Dept.

Stringent Export Controls By Commerce Dept. May Help Channel More Steel

* * *

By JACK R. HIGHT
Associate Editor

* * *

ew York

• • **Efforts to obtain** substantial onnages of steel for Western Euope next year by reshuffling presnt exports have been largely caneled out by the efforts of the tate Dept. to protect South Amerca and other areas. On the surace, the idea looked only too imple. The United States is exorting plenty of steel this year. ut shipping it to the wrong laces.

The obvious solution: Stop shiping to South America, Africa, he Middle and Far East. Send he steel to Western Europe. Intead of sending 25 pct of our teel exports to the stricken Euroean countries next year, send 5 pct.

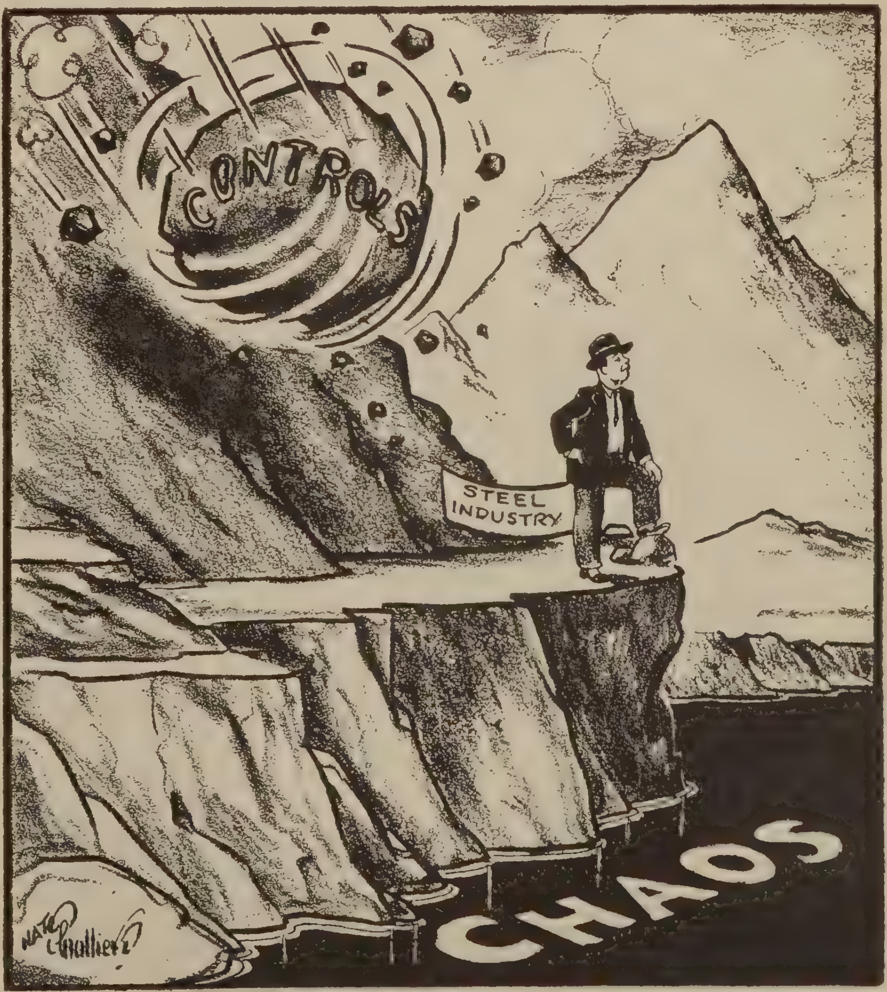
American steel exporters shudered in horror at the thought. he export divisions of steel proucing companies have been fightng for larger export quotas vhen possible. With the sheets, ars, shapes they have been able o get, the export men have been arefully building for a long term xport business. Shipping to the ountries that look like good 1950 rospects. But there has not been nough export steel to keep even hose countries happy.

There have been new countries o open up—trade to set up in frica and Asia, where little steel vas sold before the war, budding ndustry to serve with steel, all ver the world. Those long-estabished export firms have been inching each tube and bar three imes before reluctantly allocatng it.

The idea, then, of re-orienting hipments next year—sending to urope the major part of Amerian steel export—was a real blow. ut it was the interest of the tate Dept. that had more effect n the proposal than did the horor of exporters. In South Amerca in particular, the long, patient uilding of goodwill that had been major part of U. S. foreign polcy for years would have been in eopardy. The British Foreign Minister has said of coal exports, 'If I had 40 million tons of coal his year I could, in effect, run urope." So steel shipments have been a portion of the economic aid which is part of our relationship with Latin America.

But the economic aspects of such a shift in steel exports are of even more immediate concern than are the political. The interdependence of the continents has to be reckoned upon. The shortage in Europe cannot safely be relieved by ignoring other world markets any more than the sheet famine in Chicago could be alleviated by stopping shipments to Detroit.

The whole project of giving aid to Europe appears to revolve around humanitarian impulses to aid the peoples of that continent, and to save the world from the onrush of Communism (place them in your own order). If the U. S. were to accomplish these aims by, for example, stopping steel tube shipments to Venezuela, we might find that country needing a Marshall Plan of its own next year. There is always just as real a threat from the development of Communism in South



America—and certainly there is in Asia as well.

The steel for the European Recovery program, however, must be produced; it cannot be conjured. The solution will be that everyone involved must give a little ground. The needs of the 16 participating countries have already been shaved, and are being subjected to even more shaving in Washington now. U. S. domestic consumers (this is said with trepidation) will have to suffer a little reduction in favor of Europe, as well. And despite all the above reasoning, there will be some shift in the direction of existing exports, although on a small scale.

What hasn't been thoroughly discussed is that the Dept. of Commerce might be able to produce most of the steel required for the Marshall Plan next year. Since the war, there has been considerable discrepancy between the steel export figures of the American Iron & Steel Institute and those of the Commerce Dept. The government body is showing that about 10 pct of our steel output goes to consumers outside the U. S., while the trade association shows about 6 pct. There is some errata due to differences in statistical methods, but the discrepancy is thought largely due to the absence of steel company information on steel that passes through many hands before ultimate export.

The Commerce Dept. charged with controlling our exports of steel, among other things, did so rather casually until a Congressional committee put the heat on. As of Oct. 1, new, more stringent export controls came into effect. Principal idea in applying the new controls was t channel our steel exports into the countries where needed. With the enthusiastic application of comprehensive regulations on stee exports, it might develop that upwards of 2 million tons of stee products which were being shipped above the AIS export statistics can be put to better use in Western Europe.

Permanente Metals Gets Aluminum Foil Plant From Germany

Oakland, Calif.

• • • **The first German** reparations plant offered to United States industry will be producing much needed aluminum foil in this country by next summer, according to Permanente Metals Corp., who have disclosed that their high bid to the Foreign Liquidation Commissioner has been accepted and the sale approved by the State Dept.

The plant will probably be located in the State of Washington where the company now operates three other aluminum plants. Engineers will leave the United States about Jan. 1 to supervise the dismantling of plant equipment and its shipment here. The purchase, transportation, impor duty, and installation of the plan in the Northwest will represent an expenditure of approximately $ million.

The plant, allocated to the United States by the Inter-Allied Reparations Agency, will be the only aluminum foil rolling mil west of the Mississippi.

Considered one of the most efficient and diversified operations o its kind in the world, the 52-mil plant produced high quality aluminum foil of all types. In addition to the finishing mills, othe equipment includes remelt furnaces, breakdown and roughing mills, and facilities for color printing, lacquering and embossing foil, and gluing the foil to paper

The plant produced such end products as labels printed in colors, protective packaging for foods, tobacco, chewing gum and candy, wrappings for medical supplies, and foil used in the manufacture of electronic, radio, refrigeration and air conditioning equipment.

Located in the French Military Zone at Teningen, Baden, Germany, the dismantled plant wil be loaded on barges at Kehl and transported down the Rhine River to a major North Sea port. Because of winter ice forming and blocking barge traffic in the river Permanente's engineers will be faced with a race against time.

OXYGENATED FUEL: *This test cell for studying the characteristics of oxygen enriched fuel flames is a feature of the apparatus research laboratory of Air Reduction Co., Murray Hill, N. J. Among the projects underway are: injection of gases into molten metal, oxyacetylene cutting of hot steel, flame scarfing of stainless, use of oxygen for carbon reduction in the openhearth, oxygenated fuels for steel making and various methods of welding.*

Harriman's Request for Allocation Powers Leaves Steelmen Wondering

Discussion Also Covers Scrap And Coking Coal, as Well As Conservation Plan

Washington

• • • Secretary of Commerce Harriman's Nov. 26 appearance before the House-Senate Economic Committee, at which time he asked for authority to exercise "limited priority and allocation powers over steel" and other selected commodities, has left a definite feeling in parts of the steel industry that Mr. Harriman was somewhat less than frank in his noncommittal approach to the allocations question when he met with 14 leading steel executives on Nov. 25.

During his 3 hr meeting with the steel executives, Mr. Harriman refused to indicate clearly whether he was for or against domestic steel allocations at the very same time his 21-page statement to Congress, in which he asked for discretionary administrative authority to allocate, was nearing completion.

In the face of outspoken opposition to allocations on the part of the industry, the Secretary outlined to steel executives on Nov. 25 the manner in which his department would handle allocations and the difficulties expected. However, he attempted to shift the responsibility to Congress and would not commit himself on his position.

Mr. Harriman's discussion of the allocations problem came after the industry had expressed its opposition to such measures. This vehement opposition, which surprised the Secretary, may have been the reason for his failure to reveal his pro-allocation sentiments at that time, particularly since the meeting was called to effect a harmonious relationship between the industry and the Dept. of Commerce—an objective which had been achieved at the close of the meeting.

Some of this work may have been undone, however, for it is an open secret that a number of steel executives were "greatly surprised and very unhappy" about the Secretary's recommendations to Congress in view of their conversations with him on the previous day.

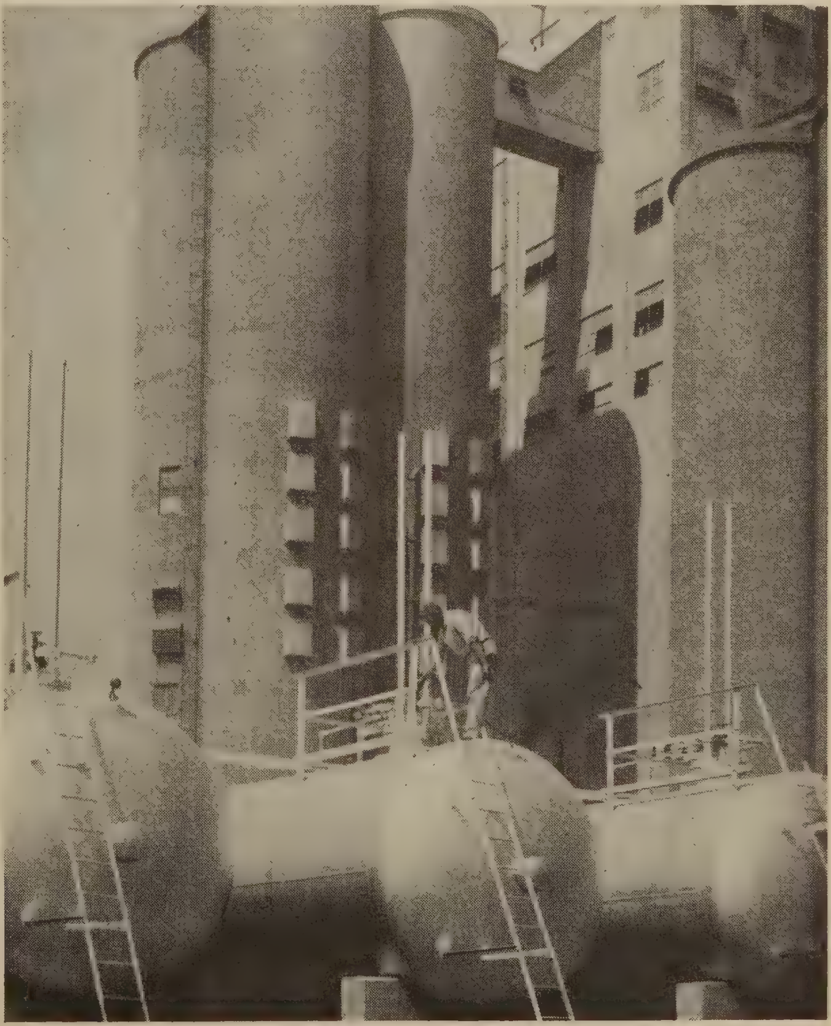
In addition to the brief discussion of allocations, the meeting concerned itself with the following subjects:

Scrap—The most important decision reached was an agreement to send an industry-government scrap mission to Europe to facilitate the preparation and return to this country of huge quantities of rubble scrap. The mission will get under way as soon as possible and will be composed of representatives of the steel and scrap industries, Commerce and State Depts. and possibly a White House adviser. The industry stated that it did not object to the government taking a loss on the return of this scrap, although they were against the use of the word "subsidy." It was realized that labor and equipment shortages were a serious drawback to returning scrap from Europe.

Mr. Harriman suggested the possibility of a scrap drive, but the industry did not believe that it would bring out much scrap. The Secretary also said that he planned to enlist the cooperation of trade associations in encouraging their industries to generate scrap.

Renewing efforts to speed up

WILL BEAT GAS SHORTAGE: *The three pressure tanks in the foreground have been recently installed at the Decatur, Ill., corn processing plant of the A. E. Staley Mfg. Co. These tanks will be used to store liquid propane gas to supplement natural gas supplies for short periods in the event of winter service interruptions.*



WAA declarations will also be made. It is believed that WAA has immediately available at least 2 million tons of scrap in unsalable surplus machine tools.

Coking Coal—The low quality of coking coal was laid to heavy exports and the shortage of coal cars. Secretary Harriman indicated that he would look into the freight car situation and that commerce would continue its check on exports of high-quality coals.

Conservation—Mr. Harriman reviewed the forthcoming order which will ban the use of tinplate for beer cans and other so-called non-essential uses. While it was realized that this action would not save much steel, it was felt that every move in this direction was of some help.

The meeting closed with an agreement to hold a similar meeting in 6 weeks.

While the Secretary, during his appearance on Capitol Hill, stated that he did not contemplate a return to a comprehensive system of controls such as existed during the war, nevertheless he asked for the whole kit and kaboodle of wartime powers, including authority "To order set-asides and to issue priorities; to issue limitation orders; and to allocate scarce materials."

As to extension of priorities powers over domestic output, Mr. Harriman emphasized that "The most important place in which this power can be exercised is over steel. By the use of limited priority and allocation powers over steel, I believe we could direct a small proportion of steel to the most essential programs, and reduce the amount of steel going into a few less essential purposes."

Mr. Harriman also asked for extension and strengthening of export controls as well as increased funds and personnel to carry out this part of the administration program. These measures would enable commerce to "undertake a broader program of export control" and "with increased statutory authority" it would be possible to "strengthen the drive against profiteering in exports," the Secretary stated.

Mr. Harriman listed the areas he would control by new legislation as allocation and inventory controls over steel, iron, freight cars, farm machinery, and possibly petroleum production equipment. "Steel is the only area in which we have sufficient information to state definitely that controls should be instigated," he declared.

Other areas which he said are under Commerce Dept. consideration for control are textiles, nitrogen, soda ash and caustic soda, soap, aluminum, newsprint, newsprint nails, soil pipe, gypsum board, hides and leather, heavy electrical machinery, and lumber. Except for tin, complete allocation power will not be sought for any of these commodities, Mr. Harriman added. But he emphasized that this list "is not final" and may grow as the Commerce Dept. finds other items warranting controls.

"**We hope** to roll back prices on higher-priced items so as to stabilize the price spiral," Mr. Harriman admitted. "Would you roll back the price of steel?" Senator Watkins, R., Utah, asked.

Mr. Harriman said he would roll back prices that are "out of line," and added that some gray market steel prices are "about double" list prices. "That would be the first effort on our part—to eliminate the gray market so far as is practicable," Mr. Harriman replied.

Asked by Senator Watkins what steps other than allocation the government would take to increase production of steel, Mr. Harriman said that "further government action may be required" to stimulate scrap recovery.

Senator Sparkman, D., Ala., asked Mr. Harriman what alternative there may be to allocation. Mr. Harriman replied, "I think we will have a chaotic situation, with rises in prices and increases in wages. The sacrifice is well worth making. We would be making a tragic mistake if we do not undertake those things which have been suggested," he asserted.

AFA Membership Record

Chicago

• • • **Membership** in American Foundrymen's Association reached another all-time high, 9881, on November 1, AFA Secretary-Treasurer William W. Maloney announced.

On that date, nearly 9000 of those holding membership in the international technical society were affiliated with local chapters in the United States, Canada and Mexico, Mr. Maloney said. Members residing in non-chapter areas of the North American continent totalled 459, and those in foreign castings centers 448.

Blast Furnace Capacity and Production—Net Tons

			PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
	Number of Companies	Annual Blast Furnace Capacity	October	Year to Date	October	Year to Date	October	Year to Date	October	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	12,551,280	925,384	9,033,562	29,206	269,865	954,590	9,303,427	89.5	89.0
Pittsburgh-Youngstown	17	25,042,040	2,069,821	19,022,276	20,236	163,009	2,090,057	19,185,285	98.2	92.0
Cleveland-Detroit	6	6,557,500	519,191	4,861,749	....	....	519,191	4,861,749	93.2	89.0
Chicago	7	14,097,710	1,102,701	10,459,492	2,373	2,373	1,105,074	10,461,865	92.3	89.1
Southern	8	4,924,670	353,116	3,243,682	12,230	97,066	365,346	3,340,748	87.3	81.4
Western	4	2,536,000	193,489	1,850,970	....	11,297	193,489	1,862,267	89.8	88.2
Total	37	65,709,200	5,163,702	48,471,731	64,045	543,610	5,227,747	49,015,341	93.6	89.6

Source: American Iron & Steel Institute

Government Steel Allocation Not Wanted by 76 Pct of PMI Members

Poll Results Show 62 Pct Feel Present Supply Sources Allocating Unjustly

New York

• • • **Results of a** survey by the Pressed Metal Institute indicate that 76 pct of the members of that group do not favor a return to government allocations of steel supply. On Nov. 6 the Institute queried its members on the subject, considering the proposal in Washington to return to government control, and the activity of the Institute as the most active critic of steel distribution.

Members of the Institute in 15 states replied to the questionnaire, and 62 pct of them indicated that, in their own opinion, they are not receiving a fair allocation of steel from their present sources of supply.

Commenting on the "historical allocation system" which the steel mills are using to ration the available steel supplies among the would-be consumers, 62 pct of the replies indicated that they believed they were not receiving a fair historical allocation.

Many of the firms replying took the opportunity to comment. A selection of the commentaries follows:

QUESTION No. 1: Under present conditions do you favor a return to government control of rationing of steel production?

Geneva, Illinois—Under no condition, present or otherwise, with the possible exception of when we may actually be engaged in war, do we favor government control of steel production in any respect.

Detroit, Mich.—No—we believe government controls lead to other evils more basically dangerous than our steel problems. Also a possibility of more, not less, black marketing.

Waterbury, Conn.—Yes, because our present sources tell us that as non-integrated mills they are not receiving hot rolled tonnage which their historical position entitles them to.

Detroit, Mich.—No. The faulty distribution could be corrected by other means than government rationing.

Warren, Pa.—We dislike government controls but fared better on a steel allotment basis than we do now.

Cincinnati, Ohio—Favor any kind of control that will block the flow of steel to the black market in exchange for scrap.

Ecorse, Mich.—No—except to see that steel exports do not impede or cripple domestic production.

Worcester, Mass.—No! We prefer to fight it out and with government control we will probably all of us get less than we are now getting.

Monroe, Mich.—Yes. If this country is to feed the world it would seem a matter only of plain common sense to see to it, by rationing or some other means, that all manufacturers of farm machinery must have steel available.

Buffalo, N. Y.—Yes, if warm air furnaces and heavy duty motor truck parts come under preferred allocation; otherwise, no.

Marlboro, Mass.—No—it seems to us this would only tend to increase the gray market.

Williamsport, Pa.—Yes, if it means we get an equitable supply.

Aurora, Ill.—No, but it appears that rationing is in the offing.

Cleveland, Ohio—Favor a reduction in amount of steel being exported, also deeper investigation into how steel gets on to the GRAY market, that these steel mills say they know nothing about, but it is their steel that is being handled by these racketeers.

Lansing, Mich.—We would favor an allocation control based on historical usage and average. Our present quota as now set up by mills is less than 33 1/3 pct of our historical usage caused by mills diverting steel to their own plant fabrication and withdrawals from this area.

Erie, Pa.—Not as regards products but do favor an inventory control to prevent excess inactive inventories.

Auburn, N. Y.—Not yet. The confusion of another C.M.P. might be worse than the present shortages. The scramble for preferences would be just as bad. Let's use pressure on the steel industry for a while longer. Whatever they do will not prove to be an overnight remedy.

San Francisco, Calif.—Yes, if done properly.

QUESTION No. 2: Do you consider that you are now receiving a fair allocation of steel by your sources of supply?

Geneva, Ill.—With respect to flat stock, strip and sheet, no. With respect to bars, generally, yes.

Detroit, Mich.—Yes, we cannot expect all we want, when we want it, and of proper quality during a time of serious shortage.

Cleveland, Ohio—No, our sources are our customers. We have no source of our own, thanks to *big* business.

Marlboro, Mass.—Yes, although of course we could use more.

Milwaukee, Wis.—No, but we are getting by.

Detroit, Mich.—Yes—even though we require five times more than prewar.

Erie, Pa.—Yes, except from one mill.

Detroit, Mich.—Fair—although not enough.

Grand Rapids, Mich.—Yes, due to use of orders for stainless as a "bonus."

Philadelphia, Pa.—Yes, but still not enough.

York, Pa.—Yes, but there is far from enough to go around.

QUESTION No. 3: Are you now securing allocations based on your historical position?

Geneva, Ill.—With respect to flat stock, strip and sheets, no. With respect to bars, generally, yes.

Detroit—One case, no—one, as much, and others, more. We do not believe it is entirely the fault of our suppliers that they cannot supply a 400 pct increase in our expanded plant requirements or of *most* other job stamping companies' mill requirements—most of whom purchased steel from secondary warehouse sources prior to 1941.

Waterbury, Conn.—To the extent of approximately 70 pct.

West Allis, Wis.—Yes, except that we formerly had three mill sources on sheet steel and two of these (Eastern mills) have discontinued selling in midwestern market.

Buffalo—No, because of mills' withdrawals from area, such withdrawal not being equalled by increased allocation from mills remaining in area.

Marlboro, Mass.—No, we are getting more than this allocation would allow us.

Aurora, Ill.—A very small percentage of what we historically should be entitled to receive.

Detroit—If promises were kept by the mills, we would be. However, so far during the past year they are far away from keeping these promises.

Grand Rapids—From all but one source.

Huntington—Yes, we are receiving steel based upon our average consumption over a period of years.

Los Angeles—We are getting more than an allocation based on our historical position, as there has been some recognition of our tremendous growth during the past ten years.

Carter Coal Co. Will Operate Again After Sale to Steel Firms

Cleveland

• • • **Purchase of all stock** in Carter Coal Co. by Youngstown Sheet & Tube Co., Interlake Iron Co. and Steel Co. of Canada, Ltd., was announced here last week.

Frank Purnell, president, Youngstown Sheet & Tube Co., has been named chairman of the board of the purchasing company; Leigh Willard, president, Interlake Iron Co., president.

Other officers are Hugh G. Hilton, president, Steel Co. of Canada, Ltd., vice-president; Henri Pell Junod, Pickands, Mather & Co., coal department; A. C. Joachin, secretary-treasurer; H. J. Muller, New York, comptroller, and Elizabeth Miller, New York, assistant secretary. The last three were employed by Carter.

Directors of the new company include J. E. Bennett, Youngstown; E. L. Clair, Cleveland; H. G. Hilton, Hamilton, Ontario, Canada; J. L. Mauthe, Youngstown Sheet & Tube Co., and Mr. Purnell and Mr. Willard.

Rumored purchase price of Carter properties was $25 million.

Pickands, Mather & Co., Cleveland, will supervise the company's sales and it is expected that operating headquarters will be moved here. For the present they will continue at 630 Fifth Ave., New York.

The Carter Coal Co. properties have been for many years a source of supply of high grade coking coal for Youngstown Sheet & Tube Co. and other producers.

The Carter mines, which have a capacity of 1.5 million tons of coal yearly, have been idle since last June 30, when the Navy, which had exercised physical operation of the three Carter mines for six months, handed back the coal mining industry to private hands.

United Mine Workers District 29 headquarters at Beckley said it had been informed by President George J. Titler that a wage contract had been negotiated with the new management for immediate resumption of operations at the Carter properties.

The company will continue the sale of domestic sizes of seamless Olga coal which the company has been marketing for many years.

The new owners have not yet stated whether other steel companies, former customers of Carter who have been forced to locate new sources of supply of coking coal, will be taken care of. Republic Steel Corp., a former Carter customer, has been taking shipments from more than 15 other producers of low volatile coal to make up the deficit, and paying premium prices, since closing of the Carter properties.

Bannon New Head Of Ford Department In UAW-CIO Reshuffling

Detroit

• • • **In a surprise move,** Kenneth Bannon, youthful president of the Ford local union at Highland Park, has been named head of the important National Ford Dept., a post previously held by Richard T. Leonard. Mr. Bannon will be in charge of negotiations for more than 105,000 Ford workers in 45 plants.

The Reuther-dominated UAW-CIO Board has made important changes in its wage and contract policy committee which determines strike strategy and approves wage patterns. In addition to elected officers including Reuther, Secretary-Treasurer Emil Mazey and Vice-Presidents Richard Gosser and John Livingston, five regional directors have been named to the committee, including Norman Mathews, Detroit; Joseph McCusker, Detroit; George Burt, Windsor; Richard Reisinger, Cleveland, and Leonard Woodcock, Saginaw.

"All those back-seat drivers make me nervous!"
Courtesy—ACF—"Wheels"

Gamble Protests That Pig Iron Exports Are Needed for Soil Pipe

Washington

• • • **Rep. Ralph A. Gamble,** R. of N. Y., chairman of the Joint Committee on Housing, has renewed protests to the State Dept. against the proposed shipment of 30,000 tons of pig iron to Italy under the interim aid program.

The proposed program of interim aid for France, Italy and Austria consists of two parts. The first part consists of a handout of $597 million. The second part consists of Export-Import Bank credits totaling $418 million.

France would be authorized, under provisions of the aid bill, to draw up to $52 million on the Export-Import Bank for purchase of industrial materials.

Italy would be authorized to draw up to $137 million from the Export-Import Bank. Of this sum, $11 million would be earmarked for purchase of ferrous metals, $9.4 million for nonferrous metals and $18.6 million for industrial machinery. Of the $11 million for ferrous metals, $6 million would be spent for 50,000 tons of steel ingots, billets and blooms, $1.1 million for 10,000 tons of structural steel, $2.1 million for 30,000 tons of pig iron, and $2 million for 20,000 tons of rail.

Declaring that "loose thinking and planning" was responsible for the proposals, Rep. Gamble asserted that recent and proposed shipments would deprive the United States of the soil pipe needed to complete 350,000 homes.

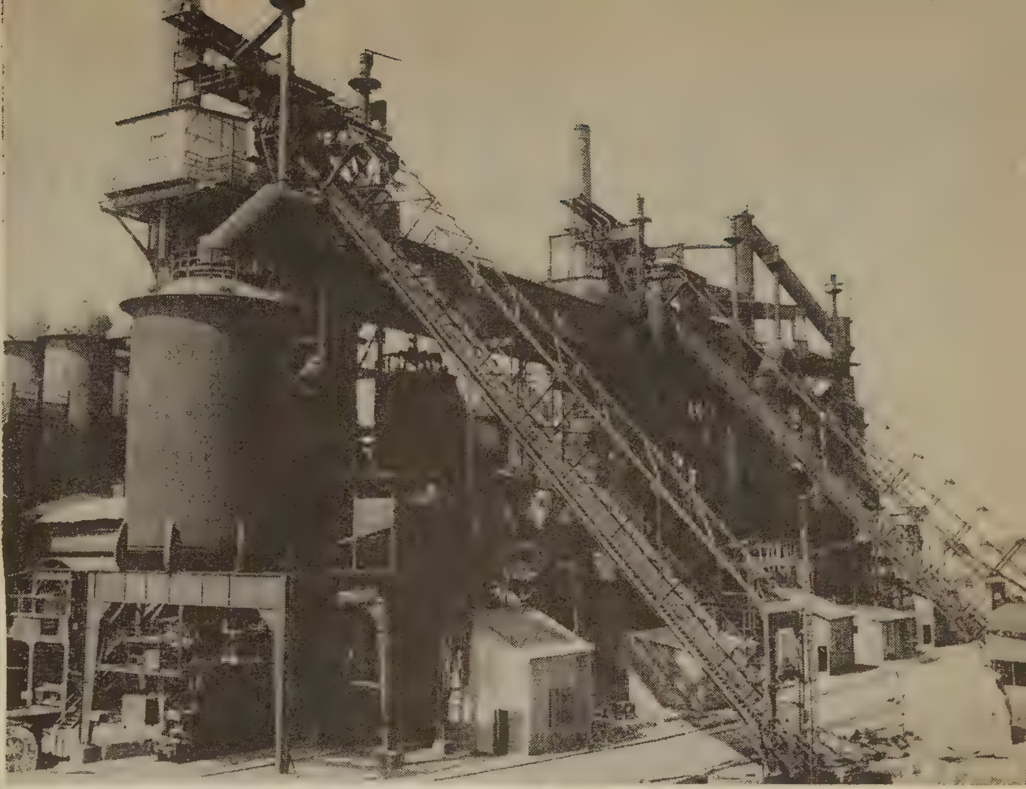
Investigation by the committee has revealed that soil pipe shortages provide the major bottleneck in home building, Representative Gamble said. This in turn, he added, is caused by the fact that blast furnaces are operating at a rate which cannot be increased; hence, any foreign shipments of pig iron must be at the expense of domestic needs.

"During the first 6 months of 1947, we exported 29,000 tons of pig iron to Italy alone," he said.

German War Plant At Bremen Awaits Dismantling Work

BELOW

• Dismantling operations are beginning on one of Germany's largest steel plants, Nord Deutsche Huette of Bremen, which has been marked for reparations to India. Before and during the war the greatly expanded plant was turning out large quantities of pig iron, coke, chemicals, gas, and cement.



ABOVE

• Removal of the refractory bricks from the blast furnaces will be a tedious job, after which the furnaces will have to be cut up with acetylene torches However, occupation authorities believe the entire job will be completed and shipment made in 12 to 18 months.

RIGHT

• This interior view shows a bank of huge steam turbines used in the manufacture of gas. The cement plant and coke plant will be the last to be dismantled, since production of both is sorely needed by the German economy. If cost of moving is not considered, 65¢ of each invested dollar can be moved.

Study Shows Bar Shipments Running

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

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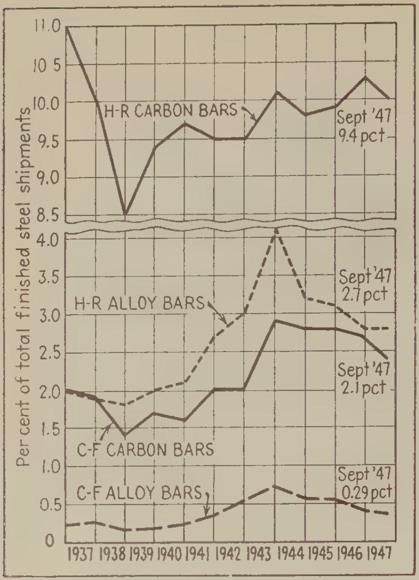
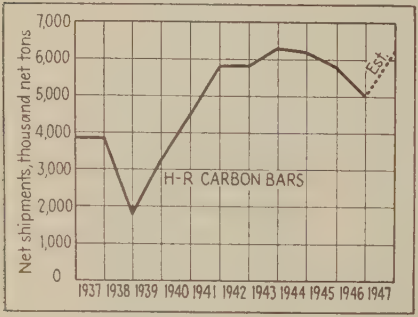


• • CHART A—*Ratio of net shipments of four types of bars expressed as a percentage of net shipments of each type bar to total finished steel shipments.*
(Data in all charts by American Iron & Steel Institute.)



• • CHART B—*Net shipments of hot-rolled carbon bars,* 1936-1947. *The text explains the basis for the* 1947 *estimate in this and in Chart C.*

Pittsburgh

• • • **Compared to** total finished steel shipments, bar shipments are worse this year than they have been at any time since 1943. For the year to date bars have fared proportionately worse than most other steel products. Though the trend has been down, tonnagewise they'll do better than they did in 1946.

Chart A shows net shipments of four types of bars expressed as a percentage of total finished steel shipments. The products are hot-rolled carbon and alloy bars and cold-finished carbon and alloy bars. Charts B and C show net shipments of these products for the same period, 1936-1947, in net tons.

It will be recalled that these products had a phenomenal demand during the war years, a demand out of all proportion to normal peacetime consumption. Much of this wartime boom was, of course, at the expense of sheet and strip. Today the demand picture appears to be approaching "normal," with due allowance for changing applications for the various types of bar.

While the trend of shipments of the four types of bars covered here declined steadily in proportion to total steel shipments all during the first three quarters of 1947, there are indications of a reversal now. Steel sales executives report that inquiries and business in these lines have recently been picking up.

The factors trade sources generally give for the proportional decline in bar production are mixed and do not apply to all bars. Intense demand for sheets is believed to be one reason for some of the drop in bar shipments. Price is said to be another factor. In the face of high demand for most steel products, those with the lower profit margins tend to suffer. This applies primarily to hot-rolled bars, it is said. But perhaps the most often mentioned reason is inventory consciousness on the part of consumers.

Pressure for flat-rolled products is given as one reason hot-rolled bar sales executives have difficulty getting space on mills. To this some observers have added the freight absorption factor. A tendency not to sell in areas where considerable freight must be absorbed to meet competition has extended hot-rolled bar deliveries in some other mills. One hot-rolled bar producer has had to make heavy quota cuts in this item to bring the books into balance and assure a fairer distribution to customers.

A tendency to balance inventories, though impossible to measure in tons, is generally felt to be an important factor in explaining the behavior of bar sales. Following VJ-Day, inventories were low and the pipelines for peacetime sizes and specifications were empty. Inventory buying began but it was not until 1946 that it became hectic. Then all steel users made frantic efforts to get steel—type, shape, size, specification, were all irrelevant as long as it was steel. It is believed that during 1946 most consumers became overstocked on bars. Many had unwanted types and sizes.

In 1947 bar buying was apparently slacked off in an attempt to better balance inventories. Jobbers who, according to American Iron & Steel Institute data, took 16 pct of hot-rolled bar production in 1946 took but 15 pct in the first 8 months of 1947. Their cold-finished bar purchases fell from 33 pct of the total in 1946 to 29 pct during the first 8 months of this year.

Because the automotive and allied industries are large users of cold-finished carbon bars, the pattern of shipments of this product follows a curve closely paralleling automotive production. This is, of course, equally true of cold-finished and hot-rolled alloy bars. In 1937, a "5 million-car" year, cold-finished carbon bar production was 749,352 net tons. In the peak war year 1944 this figure was 1,829,423 net tons.

A conservative estimate of the cold-finished bar capacity of the industry has been set by reliable sources at approximately 2.5 million tons. Excluding other newer applications, the projected increase in automotive output in 1948 would put cold-finished bar demand at about 900,000 tons. Allowing approximately a third more on top of this for products not as largely involved in the 1937 picture—new machinery, electrical equipment, refrigerators, etc.—gives a potential current natural demand of perhaps 1,200,000 tons. This is almost twice the prewar peak. Shipments this year will apparently be about 300,000 tons above this figure.

Lower Compared to Total Shipments

Decline in Proportion to Total Finished Steel May Be Due To Inventory Position

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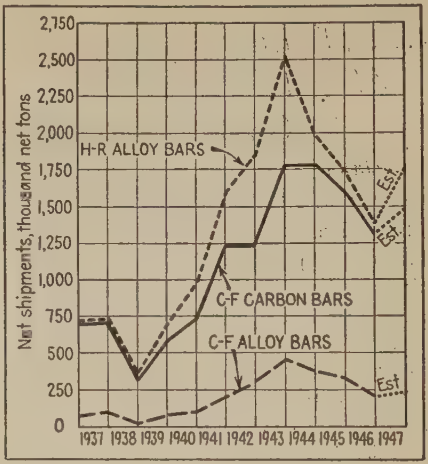
This additional tonnage is made up in part, it is believed, of substitute applications. Customers who have had difficulty getting hot-rolled bars from some sources have been taking the higher priced products, even including alloy bars. This additional 300,000 tons is therefore considered by some observers to be abnormal demand.

Superimposing Chart A on Chart C produces an interesting correlation. It should be recalled that since Chart A shows bar shipments in proportion to total finished steel shipments, it is automatically corrected for fluctuations in overall steel sales. The similarity does not hold for Chart B; hot-rolled bar production cannot be closely correlated with its percentage to total shipments.

The 1947 production data in Charts B and C is estimated. Whether this estimate is based on the fourth quarter equaling the average of the three previous quarters, or whether September production is multiplied by three, the results are almost the same. The former method produces a figure just slightly higher than the latter. Because steel sales departments have indicated some recent improvements, the former method was selected for the estimates.

One assumption that can be drawn from the similarity in the two charts of production and proportional shipments of the higher priced bars is that, excluding the war years, alloy and cold-finished bar production depend on general business conditions more than do many other steel products. The extent of their use in the automotive and other consumer goods industries is of course a prime reason for this.



• • CHART C—*Net shipments of hot-rolled alloy and cold-finished carbon and alloy bars. Note the similarity between this and Chart A.*

New Regulations For Central Procurement By the Armed Forces

Washington

• • • New regulations, directing centralized procurement for the Army, Navy and Air Force were placed into effect November 1 by Defense Secretary Forrestal.

Coordination of military purchases was advocated by Mr. Forrestal and other witnesses recently in hearings before the Senate War Investigating Committee (THE IRON AGE, October 30, p. 100). Additional positive steps are being taken, Mr. Forrestal said last week, to obtain maximum uniformity in procurement activities.

Illustrating savings realized through central procurement, Mr. Forrestal estimated that $100,000 would be saved for every $5,000,000 spent for coal supplies. Centralized procurement already has been put into effect for food, coal, lumber, ordnance equipment and demolition items, marine life-saving equipment, construction machinery and supplies and dry cell batteries. Items now under study include textiles, clothing, hand tools, office equipment, rail equipment, automotive equipment, kitchen equipment, photographic equipment, shoes, rubber tires and tubes.

Interdepartmental committees, working under the Munitions Board, are developing coordination of material inspection and steps are being taken to accelerate issuance of joint specifications for materials. Considerable progress has been made in developing a uniform system of cataloging and identifying items, he reported.

New Center Featuring Quick Service Methods

New York

• • • Yale & Towne's Philadelphia Div. inaugurated a national distribution program, which is planned to eventually encompass 32 centers, located in major industrial areas, with the recent opening of a material handling center for the New York area. The center includes a showroom, servicing and rebuilding garage, spare parts stockroom and facilities for lectures and films on modern material handling methods and equipment.

One of the primary functions of these centers, according to the company, is to reduce delays in production through quick servicing and overhauling of units in industries where material handling systems have been highly developed as well as to reduce congestion at the Philadelphia Div., which formerly was charged with these functions. Latest material handling equipment manufactured by the company will be displayed in addition to illustrations of modern material handling methods.

In dedicating the New York center, Samuel W. Gibb, president of the Materials Handling Institute and general sales manager of the Philadelphia Div., stated that production of the company's material handling line had increased 500 pct since 1939 and the present backlog is about 4 months.

H. C. Ellison Retires After 52 Years; C. P. McCabe Is Successor

Cleveland

• • • **After 52 years with Republic** Steel Corp.'s bolt and nut div. and its predecessor companies, Bourne-Fuller Co. and Upson Nut Co., Harry C. Ellison, works manager, has retired. However, Mr. Ellison will devote part of his time to Republic Steel as a consultant. At the time of his retirement, Mr. Ellison managed the largest bolt and nut plant under one roof in the United States.

C. P. McCabe, who has been assistant works manager of the bolt and nut div., has been appointed to Mr. Ellison's former job and W. G. Holt has been made assistant works manager. Mr. McCabe has been with Republic for the past 15 years. He was first employed at Republic's Ideal Foundry Div., later at Union Drawn Steel Div. plants in Gary, Ind.; Massillon, Ohio, and Hartford, Conn.; as an industrial engineer with Berger Mfg. Div. in Canton, and as works manager of the Culvert Div. in Canton. He was made assistant works manager of the bolt and nut div. in April 1944.

• • *(Left to right) Mr. Harry C. Ellison and Mr. C. P. McCabe, Republic Steel Corp.*

Mr. Holt, who will take over Mr. McCabe's duties as assistant works manager, has been a Republic employee since 1934. For a period previous to that he worked for the Trumbull Steel Co. in Warren in the bar mill and hot and cold strip mills. He came to the bolt and nut div. in 1942 as superintendent of plant protection and several months ago was made superintendent of the bar mill at the bolt and nut plant.

Pipe Fabricating Company Orders Car-Type Furnace

Pittsburgh

• • • **A car-type** annealing furnace for heat treating fabricated pipe will be built for Benjamin F Shaw Co., Wilmington, Del., by Rust Furnace Co., Pittsburgh. The furnace, to be designed by Rust for temperatures up to 2100°F, will be oil fired and have interior dimensions of 40 x 12 ft with a usable height of 10 ft 6 in. Contract price is approximately $60,000.

German Production Lags

London

• • • **General Clay,** the United States Military Governor, in a survey of the economic situation of "Potsdam Germany" made available November 11, states that exports from the combined Anglo-American zone in the first 6 months of 1947 were worth only $66 million, and are unlikely over the whole year to reach a tenth of the $2 billion estimated as the minimum necessary for a self-sustaining economy.

General Clay finds that German output in the latter half of 1946 was about 34 pct of the 1938 production, compared with a French output in the last quarter of 1946 of 90 pct. Germany's highest peak of hard-coal production is placed at 56 pct of 1938, whereas France, Poland and Czechoslovakia had exceeded their outputs of the earlier years.

Jeeps Power Snowplows

Buffalo

• • • **Scheneker Iron Works, Inc.,** has stepped up production of snowplows for jeeps by using assembly line methods and is operating at a record level, Michael Scheneker, head of the company, announced. Many of the snowplows are shipped to South America, where they are used as earthmoving equipment. The company also makes excavating equipment and boom lifts for jeeps.

A-L Buys Blooming Mill

Pittsburgh

• • • **Allegheny Ludlum Steel** Corp. has ordered a 40-in. slabbing-blooming mill, M. C. Harris, vice-president in charge of operations, has announced.

The new mill, ordered for late 1948 delivery from Morgan Engineering Co., Alliance, Ohio, will replace the blooming mill at the company's Brackenridge, Pa., plant. The mill, with a 60-ton heavy duty crane, feeder and approach tables and electrical equipment, will cost about $3.5 million, it was said.

One of the outstanding features of the mill will be its twin-motor drive. Instead of having a single electric motor with pinion gear reduction drive, separate motors will power the upper and lower rolls independently.

Mr. Harris said the new equipment will be installed without interfering with production at the Brackenridge plant. The new mill is being designed expressly for working stainless and other high alloy steel ingots.

Earns $2.79 Per Share

St. Louis

• • • **Net consolidated earnings of** the Monsanto Chemical Co. for the first 9 months of 1947, exclusive of British and Australian companies, amounted to $12,395,367, or $2.79 a share of common stock. Sales of consolidated companies for this period were $105,829,063. Sales and earnings for the comparable period of 1946 were $69,212,831 and $6,987,663, respectively, the latter amounting to $1.63 a share of common stock outstanding at that time.

The company's report pointed out that the two periods were not comparable, as 1946 third quarter sales and earnings suffered from strikes at three key plants and 1947 second and third quarter earnings suffered from the destruction of the Texas City plant.

Weekly Gallup Polls . . .

French, British Mistake U. S. Motives in Backing Marshall Plan

Princeton, N. J.

• • • **The British and French people** have certain mistaken notions about the motives of the American people in backing the Marshall Plan for aid to Europe.

In France surveys have found that nearly half the voters think the United States proposed the Marshall Plan because of a need for foreign markets to head off a depression, according to George Gallup, director, American Institute of Public Opinion.

In England, polls have found that a majority of people think the United States will want to have a say in running Britain's affairs before we will help the British further.

Both these conceptions are far out of line with what is actually in the minds of the American people as they contemplate further aid to the needy European countries.

(1) On the basis of the total adult population only two fifths of Americans believe we should have a say in Britain's affairs.

(2) Americans attach virtually no significance to foreign markets as a way of preventing a possible business collapse here.

These attitudes are shown in polls conducted from coast-to-coast by the institute. The theory that we want to interfere in Britain's affairs and perhaps tell her what she should do was tested in the following question put to American voters:

"If we lend England and other nations food or money, do you think we should insist on having something to say about the way they run their own affairs, or should we stay out of England's and other countries' affairs?"

	Pct
Have a say	41
Stay out	48
No opinion	11

The average Frenchman's idea that we want foreign trade to avoid a depression was tested here in the following question:

"What would you say are the best ways to avoid another business depression?"

The replies show the significant fact that only 1 pct of American voters say that the way to avoid another depression is to build up exports abroad or to lend Europe money so that she can buy from us.

The principal suggestions made by the public to avoid depressions are (1) to keep prices down, (2) to resort to government controls over prices and wages, and (3) to stimulate more production of goods.

The French and British attitudes were measured in recent surveys by Gallup Poll affiliates in the respective countries, as follows:

FRANCE

"In your opinion, is the Marshall Plan dictated by the desire of America to intervene in the internal affairs of Europe or by a sincere desire to aid Europe to recover, or by the need to find foreign markets to avoid an economic crisis in the United States?"

	Pct
Need for foreign markets	47
Sincere desire to aid	18
Desire to intervene	15
Combination of reasons	3
No opinion	17

ENGLAND

"Do you think it is likely, or unlikely, that America will want a say in running Britain's affairs before she will help us further?"

	Pct
Likely	57
Unlikely	21
Don't know	22

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• • • **After centuries of** abundant living, the problems booming largest in the minds of the English people today are three age-old human wants—food, shelter and fuel.

In a survey just completed, the British Institute of Public Opinion asked a cross-section of voters:

"What do you think is the most urgent problem the government must solve in the next few months?"

The American public, in answer to a similar question named prices, foreign policy and prevention of war as the most vital issues. The British answered this way:

British Name Food, Housing, Fuel Most Pressing Problems Facing the Government Today

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	Pct
Food	38
Housing	14
Fuel	10
"Crisis"	8
Production	6
Export	4
Prices	3
Foreign policy	3
Miscellaneous	14

After giving what they considered the most urgent problem, respondents were asked:

"Which do you think could best tackle this problem, a Labor, a Conservative, or a Liberal government?"

Replies to this question confirm recent polls in Britain which have traced a declining public support for the Labor government. Slightly more British voters feel the Conservative party could best solve what the voter considers to be Britain's top problem than feel the Labor party could solve it. The answers:

	Pct
Labor	34
Conservative	39
Liberal	9
No opinion	18

A recent proposal of the Attlee government, to curb the power of the venerable House of Lords, falls considerably short of having British public opinion behind it. Actually just less than a third of the voters feel that this power should be diminished, according to another institute survey.

"Do you think the power of the House of Lords should be increased, decreased, or left as it is?"

The vote:

	Pct
Increase power of Lords	5
Decrease power of Lords	32
Leave "as is"	45
No opinion	18

Industrial Briefs . . .

- **Acquisition**—Heyl & Patterson, Pittsburgh, has acquired the patents and business of the Thorsten Sampler Co., Pittsburgh. They have also acquired the exclusive right to make and sell the Kinney mechanical car unloader.

- **Resumes Production** — The Willys-Overland Motors branch plant at Maywood, Calif., resumed production recently after a war-induced lapse of 7 years.

- **Will Move**—Reich Huntington Iron Works, of Huntington West Virginia, will move into their new plant, currently under construction, shortly before the first of the year.

- **Opens Chicago Office**—Ferro Enamel Corp., Cleveland, has opened new offices at 336-338 North Central Ave., Chicago. G. W. Hofstetter will make his headquarters at the new location.

- **Purchases Plant** — The American Brass Co. has purchased from WAA for $948,070 a brass strip plant at Kenosha, Wis. The plant consists of a cold rolling and annealing building, a single story press building and a hot rolling mill.

- **Centennial** — The James Hunter Machine Co., North Adams, Mass., textile machinery, observed its 100th anniversary recently.

- **Starts Expansion** — Brace-Mueller-Huntley, Inc., has started a $250,000 expansion of its storage facilities, equipment and warehouse inventories of steel and aluminum in Buffalo.

- **Buys Building** — Leeds & Northrup Co., Philadelphia has purchased a building at 34 E. Logan St., one block from its main plant.

- **Moves**—Reps Tool Co., Inc., formerly of New York City has moved to 94 Allyn St., Hartford.

- **Pollak Grows**—The Pollak Steel Co. put in operation recently at Marion, Ohio, a major expansion program costing $500,000 and including many innovations in that particular type of steel manufacturing.

- **New Tool Company** — The McGill Carbide Tool Co., Detroit, has recently been organized to supply fine tungsten carbide tipped tools.

- **Open House**—An open house at Reliance Electric & Engineering Co. marked the swing into full production of their new plant at Ashtabula, Ohio.

- **Changes Name** — The name of the Aircraft Screw Products Co., Inc., of Long Island City, New York, has been changed to Heli-Coil Corp. as of Jan. 1, 1948.

- **Milton Expands**—The Milton Steel & Supply Co. have obtained a new steel fabricating plant in Milton, Pa., which will practically double their capacity.

- **Forms Subsidiary** — Announcement has been made of the formation of the Tube & Steel Export Corp., division of Liebermann Waelchli & Co., New York, Inc., which will continue the business heretofore conducted by their Tube & Steel Div.

- **Representative**—The American Agile Corp. of Cleveland, manufacturers of Agile welding electrodes announces the appointment of the Industrial Engineering & Sales Co. as their newest sales outlet in the western portion of Pennsylvania.

- **Ferrous Metal Sale**—WAA is offering for sale at fixed prices 4½ million lb of finished steel products, including alloy and carbon. Among the stainless items are stainless clad sheets, rounds hexagons and strip. Orders from federal agencies will be accepted by WAA on Dec. 11, from veterans on Dec. 12, and after other priority buyers have been taken care of, from commercial buyers on Dec. 22.

Canada Is Considering Extending Controls On Steel Beyond Deadline

Ottawa

• • • **Canada is considering** extension of controls beyond the present deadline of March 31st, 1948, on both steel and timber, as a part of the development program planned by Reconstruction Minister, C. D. Howe. However, in steel some enlargements may be found necessary to ensure priorities to be carried out for capital programs in conformity with over-all plans.

The present steel control powers originate from the Transitional Measure Act, but it is understood they will be transferred to the new legislation which Mr. Howe will introduce in the House of Commons this month. The same bill will carry a long list of materials which is understood to include most structural steels, importation of which will be subject to permit.

The proposed list is being prepared and if necessary could be issued immediately under the authority of the Foreign Exchange Control Act. It will cover the whole field of critical imports for use in capital programs which the government wishes to have deferred. In order to keep the list to a minimum it is the intention to select particular items such as structural steel without which programs could not be carried on, rather than to prohibit every item which might g into the installation. No prohibitory order has as yet been issued on capital goods and if possible, they will be delayed until the new Howe legislation is introduced.

The main purpose of the prohibitory list will be to draw heads of industry to the government with their plans for expansion. Permits for imports will be issued on a discriminatory basis where the program meets favor in the light o the Howe national objective of developing exports for U. S. dollars However, it is stated the government will interfere as little as possible with construction already under way. Also, it is not the intention of the Minister or Department to hold back the small operators who may want to import a single and not too costly machine to extend their business. Actually the government is after big business both on the restrictive and expansion sides.

Construction Steel . . .

New York

• • • According to reports received by the American Institute of Steel Construction, the estimated total shipments of fabricated structural steel for construction purposes for the month of October amounted to 173,580 tons, and were the largest reported since August 1942. The October shipments represent an increase of 23 pct over the same averaged month in the 5 prewar years of 1936 to 1940 and an increase of 5.6 pct over the month of September 1947.

October bookings showed a total of 151,519 tons, an increase of 12.5 pct over the previous month. The bookings for the first 10 months of the year were 1,344,124 tons or 8.7 pct greater than the averaged same months in the 5 prewar year period.

The tonnage available for fabrication as of Oct. 31 was 648,808 tons.

Following is the complete tabulation of bookings and shipments:

	Estimated Total Tonnage for the Entire Industry 1947	Estimated Total Tonnage for the Entire Industry Avg. 1936-1940
Contracts Closed		
January	104,973	107,578
February	125,881	96,280
March	149,634	124,558
April	161,338	110,783
May	112,954	126,237
June	103,273	125,835
July	153,540*	152,481
August	146,382*	113,135
September	134,630*	137,982
October	151,519	141,557
Total	1,344,124	1,236,426
Shipments		
January	140,650	92,578
February	136,126	88,626
March	137,799	115,031
April	157,392	123,650
May	154,980	123,225
June	151,882	129,969
July	169,911*	127,422
August	157,952*	136,389
September	164,345*	137,255
October	173,580	140,944
Total	1,544,617	1,215,089
Tonnage Available for fabrication within the next 4 months	648,808	348,056

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* Revised

• • • **Fabricated steel awards** this week included the following:

2150 Tons, Chicago, plant extension for Chicago, Screw Co. to American Bridge Co., Pittsburgh.

425 Tons, Grasselli, N. J., General Aniline & Film Corp. extension to building, through United Engineers & Constructors, Inc., to American Bridge Co., Pittsburgh.

400 Tons, Davenport, Iowa, building for Victor Adding Machine Co. through George A. Fuller to Bethlehem Steel Co. Bethlehem.

375 Tons, Harrisburg, Pa., Threshermen's and Firemen's insurance office building, through Ritter Bros., to Bethlehem Steel Co., Bethlehem.

240 Tons, Lancaster County, Pa., bridge over Conestoga Creek, Pennsylvania Dept. of Highways, to Bethlehem Steel Co., Bethlehem.

205 Tons, West Terre Haute, Ind., bridge 2884 through Robert H. King to American Bridge Co., Pittsburgh.

150 Tons, Leeds, Ala., high school stadium for Jefferson County Board of Education, to Virginia Bridge Co., Birmingham.

• • • **Fabricated steel inquiries** this week included the following:

4000 Tons, Omaha, Neb., veterans' hospital to be bid Jan. 9 through U. S. Engineers.

2500 Tons, Summitt County, Ohio, bridge at Akron U495-7 for State Highway Dept.

865 Tons, Clear Creek and Summit Counties, Col., tunnel and approach, Loveland Pass, state highway No. 91, State Highway Engineer, Denver, bids to Dec. 17.

400 Tons, Salt Lake City, fabricating plant for Chicago Bridge & Iron Co., Chicago.

100 Tons, Oral, S. D., bridge No. 202 U. S. Bureau of Reclamation.

• • • **Reinforcing bar awards** this week included the following:

1500 Tons, Shreveport, La., veterans' hospital to Laclede Steel Co. through J. W. Bateson Co., Dallas, general contractors.

400 Tons, South Carrollton, Ky., Green River power house for the Kentucky Utility Co. to Ceco Steel Products Corp., Chicago.

390 Tons, Los Angeles, undercrossing at Temple Street on Harbor Parkway, through James I. Barnes Construction Co. to Bethlehem Pacific Coast Steel Corp., San Francisco.

• • • **Reinforcing bar inquiries** this week included the following:

900 Tons, Iron Mountain, Mich., veterans' hospital through U. S. Engineers.

500 Tons, Omaha, Neb., veterans' hospital through U. S. Engineers.

450 Tons, State of Ohio, state highway projects.

120 Tons, Clear Creek and Summit Counties, Col., tunnel and approach, Loveland Pass, state highway No. 91, State Highway Engineer, Denver, bids to Dec. 17.

• • • **Plate awards** this week included the following:

22,230 Tons, Oakland, Calif. pipe for Unit D, Spec. 77, East Bay Municipal Utility District, second Mokelumne Aqueduct, to Western Pipe & Steel Co., San Francisco.

10,870 Tons, Oakland, Calif., pipe for Unit C. Spec. 77, East Bay Municipal Utility District, second Mokelumne Aqueduct, to Western Pipe & Steel Co., San Francisco.

• • • **Railroad car awards** this week included the following:

Baldwin Locomotive has received an order for 33 locomotives from the India Supply Mission. The Pressed Steel Car Co. has received orders for 1950 all welded twin hopper cars, 70-ton capacity, from the Union Pacific R. R. Also 1000 70-ton hopper cars from the B & O R.R. The Baltimore & Ohio R.R. has ordered another 1000 70-ton hopper cars from Bethlehem Steel Co.

Machinery Exports Required

London

• • • A considerable proportion of Britain's production of machinery of all kinds during the next 6 to 12 months will have to be exported. H. A. Marquand, speaking at Exeter on behalf of the Government, said that factories and farms had asked for improved equipment to stimulate production, but that there was no escape from the need to export machinery.

"You cannot go to overseas countries and ask them for wheat, maize, butter or bacon and say that in return all they can get will be fountain pens, cosmetics, dolls eyes and toys," Marquand said.

Coming Events

Dec. 1-5 American Society of Mechanical Engineers, annual meeting, Atlantic City, N. J.

Dec. 1-6 Twenty-First Exposition of Chemical Industries, New York.

Dec. 4-6 Electric Furnace Steel Committee, AIME, annual conference, Pittsburgh.

Dec. 11-13 Electron Microscope Society of America, annual meeting, Philadelphia.

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Jan. 12-16 Society of Automotive Engineers, annual meeting, Detroit.

Jan. 12-16 National Materials Handling Exposition, Cleveland.

Jan. 19-20 Institute of Scrap Iron & Steel, Inc., annual convention, Chicago.

Jan. 21-24 American Society of Civil Engineers, annual meeting, New York.

Feb. 10-11 Pressed Metal Institute, annual meeting, Buffalo.

Feb. 15-19 American Institute of Mechanical Engineers, annual meeting, New York.

Mar. 3-5 Society of Automotive Engineers, national passenger car meeting, Detroit.

Mar. 18-19 Magnesium Assn., annual meeting, New York.

$7 Million Program For Improvement By Colo. Fuel and Iron

Denver, Colo.

• • • **Improvements** costing $7 million were approved by the board of directors of the Colorado Fuel & Iron Co. at their annual meeting. Included in these improvements will be a new rod mill and additional wire drawing facilities at Pueblo, which will increase the wire production capacity nearly 33 pct; rehabilitation and relining of idle blast furnace X at Buffalo; new fine wire drawing machines to replace present "dry" machines at Palmer, there will be 11 new machines using the "wet" wire drawing process; continuation of the modernization program at Mt. Wolf; and a new office building and complete revamping of the Calif. Wire Cloth plant at Oakland.

Carl W. Meyers, president of CF&I, stated that the program of improvements had been made possible through increased earnings of the corporation during the last fiscal year, that through the improvement program the company will be in a more advantageous position competitively, and will be able to maintain a high level of employment. Mr. Meyers declared that it would be necessary to main the present rate of earnings to continue to justify plant modernization and improvements.

Officers re-elected by the board of directors were Charles Allen, Jr.; chairman, Carl W. Meyers, president; A. C. Bekaert, Franklin Berwin, A. F. Franz and Newell H. Orr, vice presidents; J. T. Crout, treasurer, and D. C. McGrew, secretary.

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50 YEARS AGO

THE IRON AGE, *December 2, 1897*

HAVE YOUR WAGES BEEN RAISED?

• "Managers of a large iron and steel establishment have given us an interesting statement. It shows that the average wages of their workmen, including boys but excluding certain highly paid classes of management, amounted to $1.92 per day for one month. This is not a bad showing for an establishment employing many unskilled workmen who need little training for the work. It is certainly far better than the traditional ideal wages of 'a dollar a day and roast beef' which was the war cry of a political party in the 50's."

• **"The plunger of a new power pump built by C. O. Lucas of Greenville, Ohio, is guided at both ends, the power being applied between the bearings. The pin in the crank has a roller working on it within the link and is designed so that wear occurs on the pin and roller, which are easily replaced, rather than on the link."**

• "Report from correspondent in Vienna, Austria—Only a few years have elapsed since American machines and tools began to make their way throughout the civilized world. American manufacturers may now say with pride that they are going ahead of all competitors and that their goods are generally acknowledged as the standard of capacity and finish."

• **"The Russian Petroleum & Liquid Fuel Co. is now being financed in London to purchase and develop the petroleum fields of southern Russia, with a capital of $6,000,000."**

• "Production of calcic carbide from which acetylene gas is derived has increased to the point where illumination of dwellings with this gas is foreseen. Acetylene gas has a much higher illuminating power than city gas, 5 cu ft being equal in value to 60-75 cu ft of ordinary gas. A dwelling is piped in the ordinary manner and a gas generator is placed in the basement connected to the pipes."

Pig Iron Output Holds 75 Pct Capacity Level In Canadian Plants

Toronto

• • • **Canadian pig iron** production in September held at practically the same level as in the preceding month, but was almost four times greater than in September, 1946, when output was sharply curtailed through strikes at the three major steel plants. For September, pig iron output amounted to 169,630 net tons or 74.1 pct of total capacity, and compares with 166,878 tons or 72.9 pct for August and with 45,078 tons in September last year. Production of September included 136,678 tons of basic iron of which 125,637 tons were for further use of producers and 11,041 tons for sale; 20,161 tons of foundry iron of which 19,769 tons were for sale and 393 tons for further use, and 12,791 tons of malleable iron, all for sale.

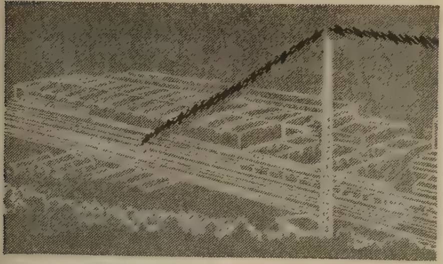
Blast furnace charges in September included 313,965 tons of iron ore; 17,118 tons of mill cinder, scale and sinter, etc.; and 5738 tons of scrap. During the month 12 out of a total of 14 furnaces in Canada were in blast.

For the nine months ended Sept. 30, 1947, cumulative production of pig iron totalled 1,466,814 net tons, as compared with 1,032,067 tons in the same period of 1946 and with 1,367,389 tons in 1945.

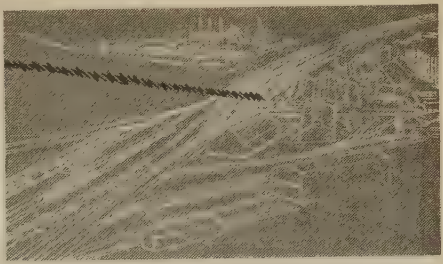
Production of ferro-alloys in September amounted to 11,152 net tons, against 11,398 tons in August and 6164 tons in September, 1946. Output for the month included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus. For the first nine months this year production of ferro-alloys totalled 112,702 net tons, compared with 87,411 tons in 1946 and 143,607 tons in the 1945 period.

Following are comparative monthly production figures for 1947 in net tons:

	Pig Iron	Ferro-alloys
January	177,313	9,644
February	150,632	9,357
March	164,403	14,197
April	160,749	13,015
May	160,230	15,325
June	159,826	16,212
July	157,153	12,402
August	166,878	11,398
September	169,630	11,152
Total 9 Mos.	1,466,814	112,702



FM TOWER: *A two-way radio network at Weirton Steel permits three diesel switchers to do the work of four. Eight switchers are served by the transmitting and receiving tower shown in the sketch at the left.*



New Two-Way Radios Boost Yard Efficiency At Weirton Steel Plant

° ° °

Weirton, W. Va.

• • • **Two-way radio** in switching engines at the Weirton Steel plant have reportedly stepped up the efficiency of yard operations here by a third. One of the first steel mill installations of its kind links the yardmaster and eight diesel electric locomotives by two-way FM radiotelephone service.

Two months after its installation, operating men are able to estimate that three engines can now do the work of four. Company officials believe it will step up yard operating efficiency by 25 to 33 pct. Accurate data is not yet obtainable because the new equipment has not been in service long enough for proper comparison. The increased efficiency is due mainly to speedier transmission of messages to engine crews. The old way was by loudspeaker, telephone relay and word of mouth. Now engines can be reached directly and one engineer can talk to another.

Ability to weigh cars in fog is a big gain registered by the radiotelephone. The valley sometimes became so fogbound that even fusee signals were invisible to engineers, and cars piled up at the scales. Now, despite the fact that the engineer can't see the scale he can get radioed instructions to move a car up or back a few feet to line it up. At crossovers, one engineer can sometimes "ask" another to move his train enough to clear the crossing.

The FM network, which broadcasts on an assigned frequency, covers all 36 miles of track in the Weirton plant. It was built by Westinghouse and installed by Weirton's electrical department. Maximum range from the transmitter tower is 25 miles. The yardmaster down in the plant operates the transmitter at the tower by remote control. Westinghouse engineers point out that additional remote control consoles could be located at other points in the plant. Like the present unit, they would be connected by wire with the transmitting station located on the side of a hill overlooking the works. Each switching engine has its own transmitter, with a telephone type handset for the engineer in the cab. Over it the engineer reports track conditions and safety hazards along the line.

Most operations, by their very nature, are confined to a radius of 2½ miles of the yardmaster's office. But contrary to popular impression of FM transmission, this network is not limited to line of sight transmission. Hills blanket certain sections of the outlying tracks from the transmitting and receiving tower. Buildings shield the main antenna from the hot metal train when it is over at the openhearth shop. Nevertheless, transmission and reception continue behind both types of screen.

The steel company took delivery of its first diesel electric switcher—it uses 110 and 115-ton units—in May 1945. It now has eight of these large switchers and several diesel cranes. By April 1948, according to present plans, all coal fired equipment will be replaced with diesels.

Canadian Production Of Steel Ingots And Castings Announced

Toronto

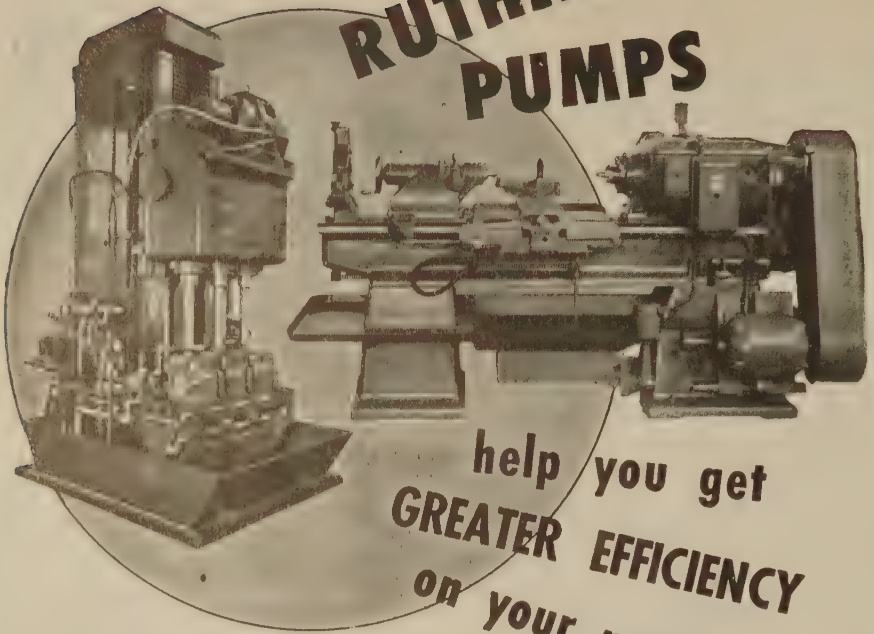
• • • **Canadian production** of steel ingots and castings for September showed only a fractional change from the month immediately preceding, but tripled the rate for September 1946, when the greater part of Canada's iron and steel output was shut off due to strikes. Production of steel ingots and castings in September amounted to 234,188 net tons, equal to 79.2 pct of total capacity, compared with 233,754 tons or 79 pct for August and with 76,564 tons in September last year. This September output included 225,457 tons of steel ingots and 8731 tons of steel castings.

Steel furnace charges in the month under review included 121,967 tons of pig iron, 71,536 tons of scrap of consumers' own make, and 60,373 tons of purchased scrap.

For the first nine months this year, production of ingots and castings totalled 2,183,564 net tons, compared with 1,750,846 tons in 1946 and with 2,248,215 tons in the 1945 period.

Following are comparative monthly production totals for 1947 in net tons:

	Steel Ingots	Castings
January	243,557	6,241
February	223,124	6,098
March	263,193	6,539
April	244,998	7,158
May	235,978	8,098
June	230,581	7,716
July	226,443	5,898
August	226,180	7,547
September	225,457	8,731
Total 9 Mos.	2,119,511	64,053



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Superior Iron Ore Consumption Gains To Shorten Supply

Cleveland

• • • **Consumption** of Lake Superior iron ore by U. S. and Canadian blast furnaces rose to 7,150,860 gross tons in October, topping the 6,491,937 tons consumed in September, and October 1946 consumption of 6,625,145 tons, according to the monthly report of the Lake Superior Iron Ore Association.

The Association's report showed cumulative consumption of 66,667,685 gross tons compared to 50,446,030 tons on the same date a year ago.

Total stocks of iron ore on hand at furnaces and Lake Erie docks were 41,640,946 tons Nov. 1, compared to 38,369,549 tons a month ago and 40,435,384 tons Nov. 1, 1946.

Blast furnaces depending principally on Lake Superior iron ore numbered 171 U. S. and 8 Canadian. There were 12 blast furnaces idle in the U. S. and 2 in Canada, the Association's report showed.

Following Nov. 17 loadings, a check revealed that 74,987,202 gross tons had been moved on the lakes this year, and ore experts anticipate that an additional 2.5 million tons will be brought down before the close of navigation, making a total all lake movement of about 77.5 million tons. Iron ore moved by rail is expected to total about 1.7 million tons, which will bring the total season's movement to 79 million tons plus.

With demand for pig iron at an all-time high, coupled with the steel mills' need for hot metal and the high price of scrap, sources in the trade believe that October consumption of 7,150,860 gross tons may represent the average during the winter period.

Loadings during the period Oct. 17 to Nov. 17 probably raised total stocks on hand to about 48.6 million gross tons, which at the October rate of consumption would mean that about 14 million tons would be on hand at storage points and furnace yards April 1, which is somewhat less than the 17.4 million tons on hand April 1, 1947.

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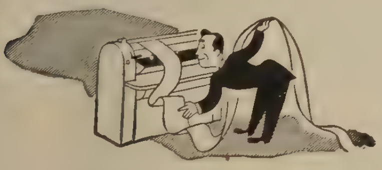

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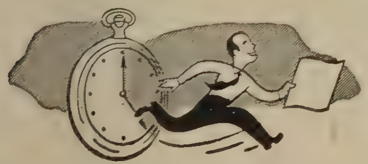

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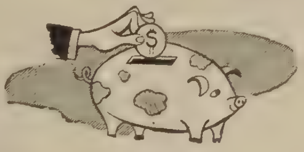

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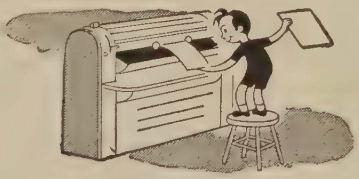

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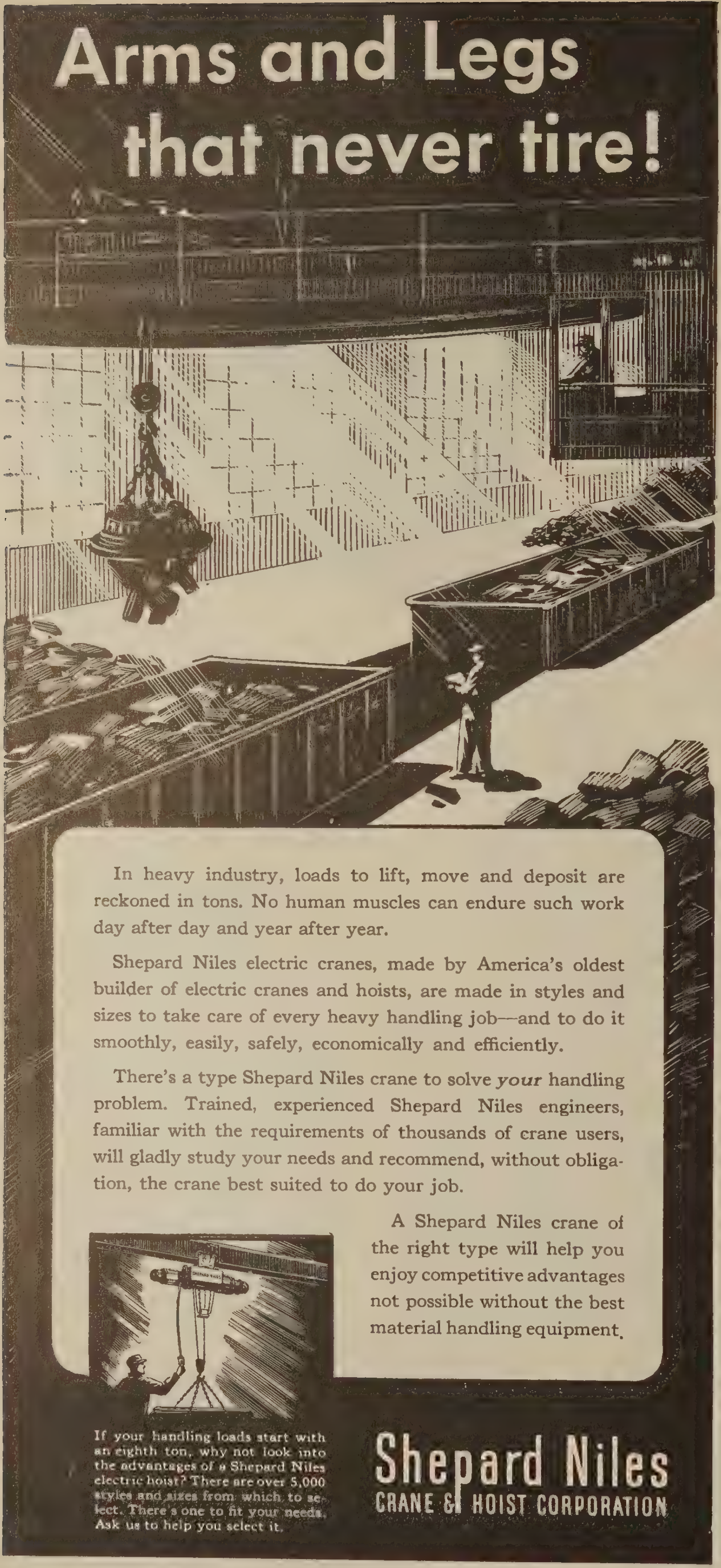

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Imports From Russia Exceed Exports; All Trade on Cash Basis

Washington

• • • **Statistics released** by the Office of International Trade reveal that imports from Russia during the 1947 third quarter exceeded exports by the United States to the Soviet by $4 million.

Exports to the USSR during the three-month period aggregated $23 million as compared with $27 million in imports from that nation. These shipments have been on a cash basis since UNRRA and Lend-Lease shipments have been closed out.

Total shipments to Russia for the first nine months total $114 million. Of this amount, $32 million worth was UNRRA material and $16 million Lend-Lease. The remaining $66 million was composed of commercial goods.

About $80 million of the total shipments comprised machinery and vehicles. Another $15 million was made up of iron and steel mill products. Of the machinery shipments, about $59 million worth consisted of industrial equipment.

Aside from heavy shipments of furs — $48 million of the total— the chief commodities imported by this country were $6 million worth of chrome ore, $5 million worth of manganese ore, and nearly $3 million worth of platinum and its combinations.

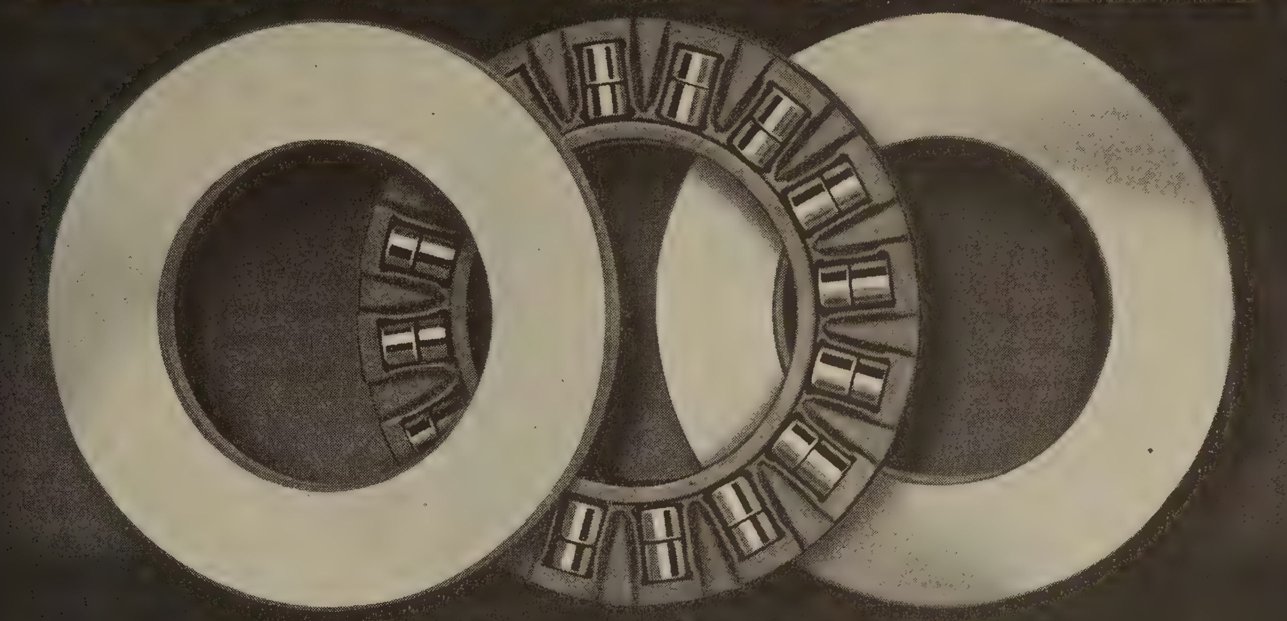
Officers Chosen by Scrap Institute of Cincinnati

Cincinnati

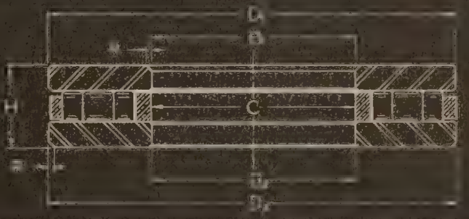
• • • **At its recent** meeting the Cincinnati chapter of the Institute of Scrap Iron & Steel Inc., elected the following officers: president, Ralph Kopelove, Kopelove Iron & Metal Co., Dayton; vice-president, Roy Adams, Frank Adams & Co., Norwood, O., secretary-treasurer, Louis Goldberg, M. D. Friedman Co., Portsmouth.

The following were elected to the executive committee: Ben F. Schottenfels, David J. Joseph Co., Cincinnati; Emil Klempner, Klempner Bros. Co., Louisville, Ky.; Joseph Mansbach, Mansbach Metals Co., Ashland, Ky.; L. W. Pryse, Hickman, Williams & Co. Inc., Cincinnati; Joseph Summer, Summer & Co., Columbus.

KAYDON TYPE RT THRUST ROLLER BEARINGS



STRAIGHT ROLLER TYPE
FLAT RACES
TYPE RT



SIZES AS LISTED
CARRIED
IN STOCK

Bearing No.	Sizes and Dimensions • See Drawing Above						Roller Diam.	R 45° Chamfer	Lbs. †Capacity at 100 R.P.M.
	B_1	B_2	C	D_1	D_2	H			
RT-26	2.002"	2.015"	2.010"	5.968"	6.000"	1.375"	½"	.062"	36,000
RT-27	2.002	2.015	2.010	6.968	7.000	1.375	½	.062	48,300
RT-28	2.002	2.015	2.010	7.968	8.000	1.375	½	.062	65,400
RT-36	3.002	3.015	3.010	5.968	6.000	1.375	½	.062	29,800
RT-37	3.002	3.015	3.010	6.968	7.000	1.375	½	.062	43,600
RT-38	3.002	3.015	3.010	7.968	8.000	1.375	½	.062	55,600
RT-39	3.002	3.015	3.010	8.968	9.000	1.375	½	.062	67,500
RT-47	4.002	4.015	4.010	6.968	7.000	1.750	⅝	.062	34,700
RT-48	4.002	4.015	4.010	7.968	8.000	1.750	⅝	.062	54,600
RT-49	4.002	4.015	4.010	8.968	9.000	1.750	⅝	.062	69,400
RT-410	4.002	4.015	4.010	9.968	10.000	1.750	⅝	.062	89,300
RT-58	5.002	5.015	5.010	7.968	8.000	1.750	⅝	.062	40,300
RT-59	5.002	5.015	5.010	8.968	9.000	1.750	⅝	.062	63,300
RT-510	5.002	5.015	5.010	9.968	10.000	2.000	¾	.125	83,300
RT-511	5.002	5.015	5.010	10.968	11.000	2.000	¾	.125	111,600
RT-512	5.002	5.015	5.010	11.968	12.000	2.000	¾	.125	136,300
RT-69	6.002	6.015	6.010	8.968	9.000	2.000	¾	.125	48,300
RT-610	6.002	6.015	6.010	9.968	10.000	2.000	¾	.125	76,000
RT-611	6.002	6.015	6.010	10.968	11.000	2.000	¾	.125	100,100
RT-612	6.002	6.015	6.010	11.968	12.000	2.000	¾	.125	124,300
RT-710	7.002	7.015	7.010	9.968	10.000	2.000	¾	.125	62,400
RT-711	7.002	7.015	7.010	10.968	11.000	2.000	¾	.125	85,800
RT-712	7.002	7.015	7.010	11.968	12.000	2.000	¾	.125	109,200

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Committee Appointed To Expedite Flow Of Maintenance Scrap

Cleveland

• • • **Leaders in local industries** affected by the shortage of scrap met here to make plans for easing the situation, which, in the opinion of the group, may continue for another year or more.

Committees of the various groups were appointed at the meeting which was called at the request of Northern Ohio Chapter, Institute of Scrap Iron & Steel, Inc., according to Jack Levand, president.

The steel industry was represented by William J. Betzler, purchasing agent of scrap, Republic Steel Corp. W. W. MacMillen, purchasing agent for the National Malleable & Steel Castings Co., represented the steel castings group; the purchasing agents association named Edward Pike, American Fork & Hoe Co., and Walter Frazee, Steel Improvement & Forge Co. as representatives, and the Gray Iron Founders' Society named H. J. Trenkamp, Jr., Ohio Foundry Co. and treasurer of the society; Samuel Ruddock, Ferro Machine & Foundry Co.; and Clem A. Loeffler, Grabler Mfg. Co.

The Scrap Iron & Steel Institute's committee with Samuel Urdang, of A. Shaw & Co. as chairman and Leonard Abrams as vice chairman, was appointed by Mr. Levand, resident manager of Luria Bros. Other members of the committee include Leon Bialosky, Cleveland Iron & Metal Co.; William I. Katz, Acme Iron & Metal Co.; Harry Lederer, Lederer Iron & Steel Co.; S. Allen Nathanson, M. Cohen & Sons Co.; Browne Shapero, Max Friedman Co.; Bernard Zipp, Paramount Steel & Supply Co.; and Ray Wilcoff, Apex Steel & Supply Co.

Efforts of the group will be directed toward expediting the flow of maintenance scrap, since production scrap is coming out.

Shipbreaking Facility

Washington

• • • **Walter W. Johnson Co.,** successful bidder for the major portion of the Pollock-Stockton Shipbuilding Co.'s West Yard at Stockton, Calif., will convert the property into a shipbreaking facility, it has been announced here.

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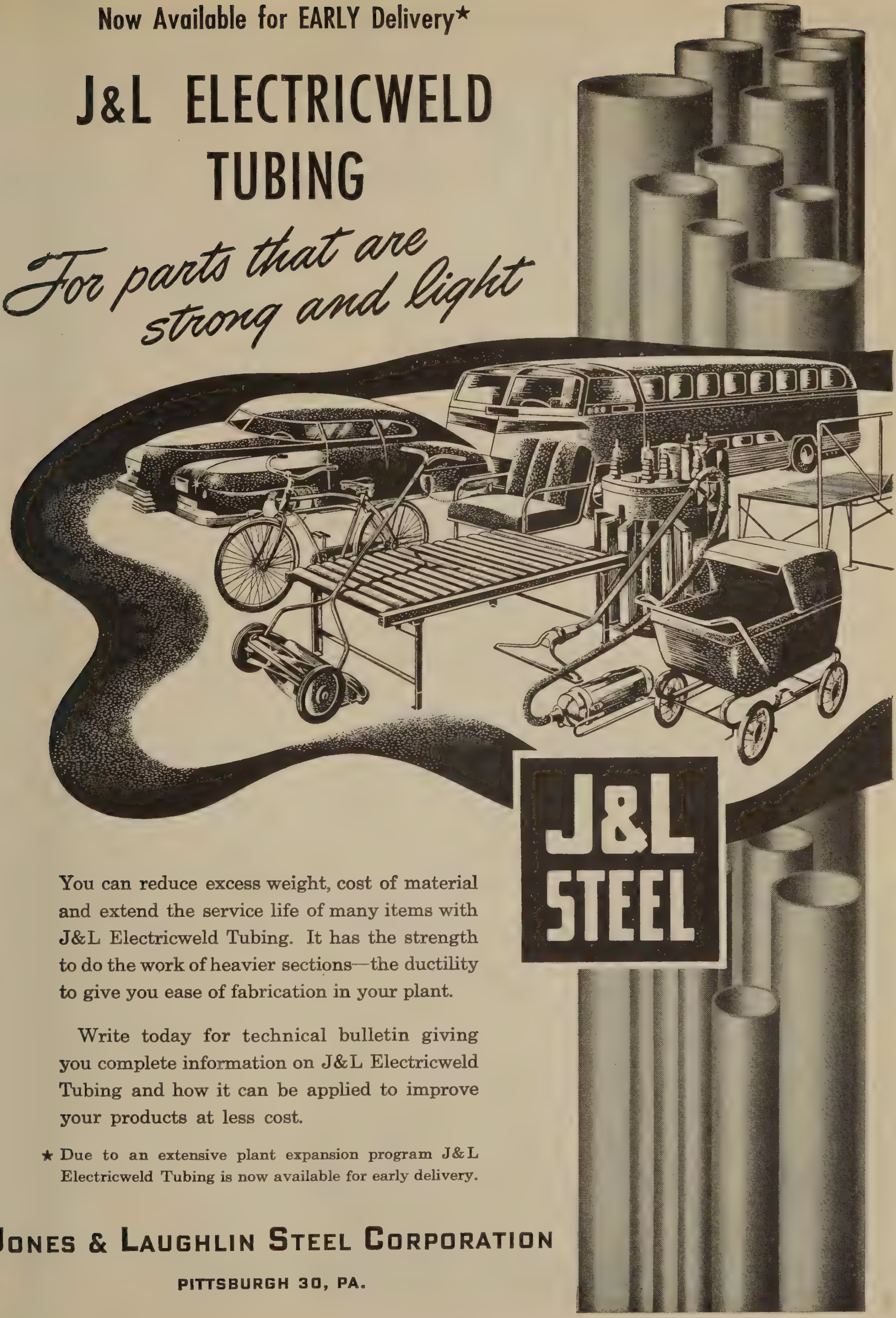

You can reduce excess weight, cost of material and extend the service life of many items with J&L Electricweld Tubing. It has the strength to do the work of heavier sections—the ductility to give you ease of fabrication in your plant.

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Vibration represents part of the productive power of a machine escaping through the foundation on which it rests, and the result is decreased production efficiency.

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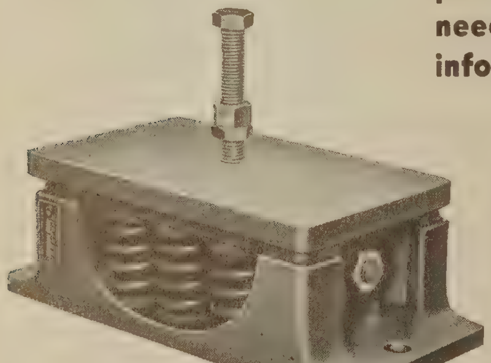
Korfund Steel Spring Isolators also save wear and tear on the machine, enable efficient production line arrangement and reduce noise and vibration within a building. Korfund Vibration Control Engineering applies the skill of years of experience in solving vibration problems to your immediate needs. Write for complete information.



Korfund Type LK Vibro-Isolator shown at left is of steel spring construction with resilient chocks at the corners to act as stabilizers. These inserts can be adjusted to the correct damping for the individual installation.

KORFUND VIBRATION CONTROL

THE KORFUND COMPANY, Inc., 48-33 32nd St., LONG ISLAND CITY 1, NEW YORK

Justice Dept. Gains Final Judgment To Abolish Association

Washington

• • • **Antitrust proceedings** against the Grinding Wheel Manufacturers Association and five abrasive manufacturers were terminated last week with entry of a final judgment, the Justice Dept. has announced.

The judgment orders dissolution of the association and prohibits any agreements among manufacturers fixing prices, discounts or other terms of sale, or establishing classifications of customers. Each defendant individually is required to revise its price lists, according to Attorney General Clark.

The defendants who consented to the judgment are, in addition to the association, Norton Co., Worcester, Mass.; Carborundum Co., Niagara Falls, N. Y.; Bay State Abrasives Products Co., Inc., Westboro, Mass.; Simonds Abrasive Co., Philadelphia, and Macklin Co., Jackson, Mich.

Hiring Rate Increases

Washington

• • • **Seasonal upturn** in production as well as replacement of vacation workers during September raised the hiring rate for manufacturing industries from 53 per 1000 workers to 59. The rate for workers in iron and steel and their products rose from 42 to 50 per 1000, according to the Dept. of Labor. While lay-offs and other separations in the iron and steel industry remained at less than five per thousand employees, the quit rate for iron mines rose sharply from 34 to 51 per thousand as the shipping season drew toward a close.

Few Work Stoppages

Washington

• • • **Bureau of Labor** Statistics said that about 75,000 workers — the lowest number since February—were involved in some 200 new work stoppages in September.

The 200 stoppages which began in September were the fewest in any month since December, 1946, when 168 stoppages were recorded, BLS said. Plant idleness was estimated at 2 million man-days, less than for any month since March.

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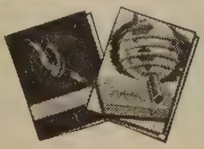
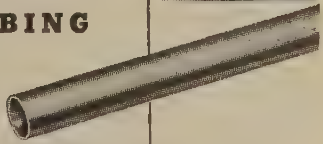


Globeiron
SEAMLESS TUBING



ARMSTRONG *Drop Forged* **LATHE DOGS**

ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head of safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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Borg-Warner Plans $35 Million Plant Expansion Program

Chicago

• • • **Six divisions of Borg-Warner** Corp. now have under way, or soon will start construction on, projects which will increase their manufacturing facilities. Since 1940 Borg-Warner has spent, or committed, $35 million for improved or enlarged production facilities.

The Mechanics Universal Joint Division, Rockford, Ill., expects to have completed by Jan. 1 an additional 137,300 sq ft plant in Memphis, Tenn., which, with complete equipment, will cost nearly $3 million. This plant will produce universal joints and driveshafts for automobiles, and will employ approximately 500 persons

The Norge Division is increasing the total floor area of its Effingham, Ill., plant to nearly double that contained in the factory when it was purchased late in 1945 for the manufacture of gas and electric ranges. At the washing machine plant in Herrin Ill., floor area is being increased one-fourth, and in the Chattanooga plant, where compressor mechanisms and portable water coolers are made, manufacturing facilities have been expanded to a point where productivity is expected to be doubled.

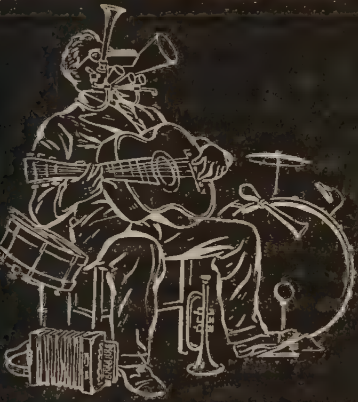
The Detroit Gear Division which formerly operated in two locations in Detroit, has transferred all its manufacturing activities to one plant which has been equipped to make straight-line output possible.

The Borg & Beck Division, a manufacturer of automotive clutches, will start immediate construction of a $500,000 one story L-shaped building that will provide 77,240 sq ft of additional floor space.

The Pesco Products Division is starting construction of a $120,000 laboratory on a newly acquired 35 acre site in suburban Cleveland, which will be used for testing aircraft fuel systems.

The Morse Chain Co. Division is nearing the completion of a $2 million 3 yr program of rehabilitation and expansion in its Ithaca, N. Y. plant. At least 50 pct of the plant layout has been rearranged.

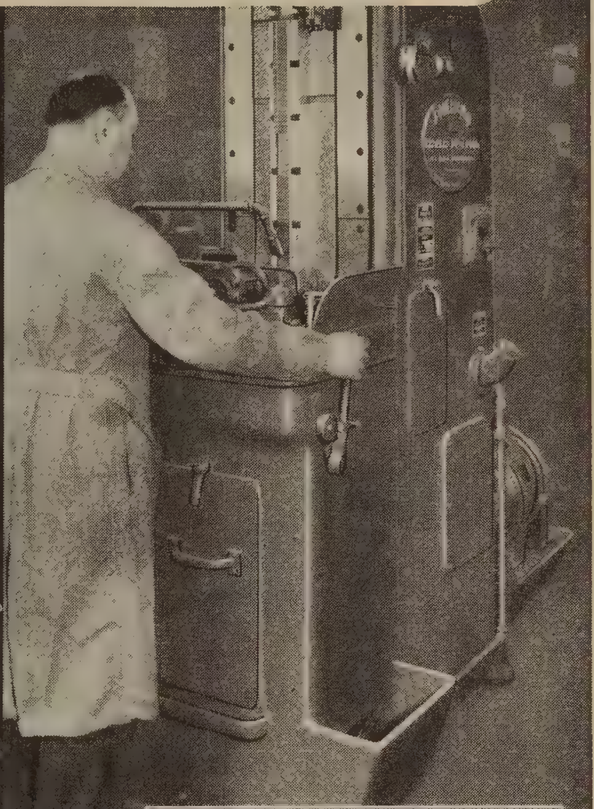
AN ALL-PURPOSE BROACHING MACHINE



That's What You Get with *American's* 3-Way

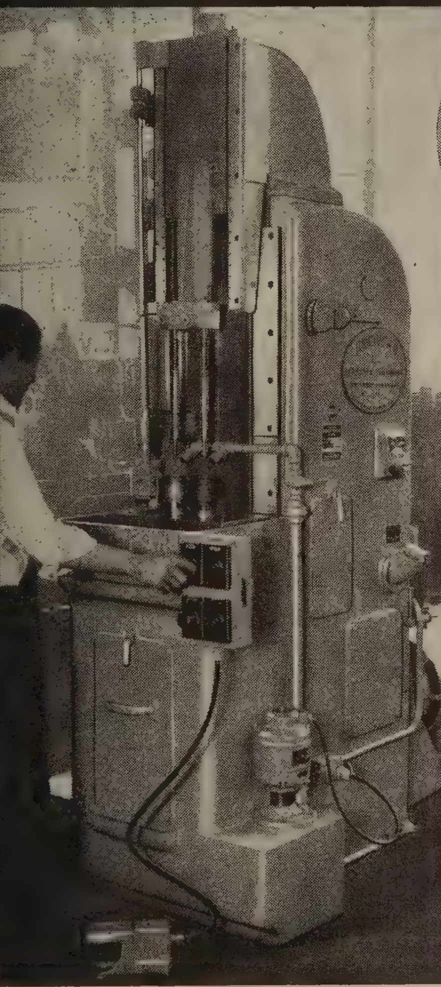
A machine that gives you pull down, push down, and surface broaching; a machine that can be used for a wide variety of internal and surface broaching jobs—that's *American's* exclusive 3-Way Vertical Hydraulic Broaching Machine. You can change over from one type of broaching operation to another quickly. It requires only replacement of fixture and broaches, and addition of pull head and lugs.

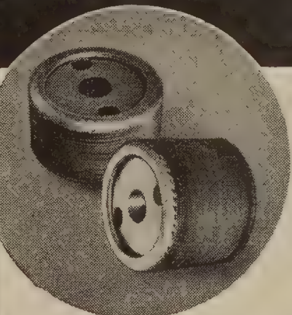
For all types of broaching machines, for all kinds and sizes of broaches, for tooling and fixture design based on more than a quarter century of broaching experience—look to *American*, the one source for all your broaching needs. For the best in broaching—machines, tools, and engineering—see *American* first!



To illustrate the wide variety of broaching jobs possible on this all-purpose machine, the Standard T-8-24 is pictured above.

This machine is operated by manual controls and the broach holders are mounted directly on the main machine slide. The operation is surface broaching the teeth in a round bar with the tooling designed to automatically clamp and eject the broached parts.





For broaching the holes in laminated commutator parts an *American* T-8-24 3-Way machine equipped with special broach retriever unit, foot switch, and electric controls was provided.

With the above extra equipment the operation is semi-automatic. Operator loads two parts and starts retriever unit, which lowers broach pilots through work into automatic quick connecting pull heads. Machine slide pulls broaches through work, operator unloads and starts return of machine slide by foot switch. At end of return stroke he loads two more pieces and begins cycle again.

★ ★ ★

A new circular tells the complete story of *American's* Type-T 3-Way broaching machine. A letter or post card will bring it to you by return mail. Write today for Circular 100.

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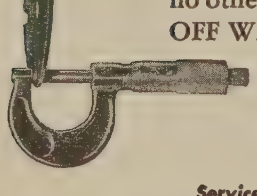

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344 DELAWARE AVENUE BUFFALO 2, NEW YORK

Unusual Tool Expedites Midget Motor Output

(CONTINUED FROM PAGE 67)

the same setup. This tool, shown at left in fig. 7, would do the job alone but because the rollers come so close together it is not possible to employ a centering pilot pin. The final result, however, is to seal the cap and bearing permanently in place and to hold them in correct relation to the motor axis.

Application of the second and larger bearing with its felt and cap at the opposite end of the housing follows insertion of the armature into the housing, and a check to see that it has the desired end play. Because of the projecting lugs just below the cap, it is not feasible to spin over a lip to hold the cap, as at the opposite end. Consequently, the fastening is made with three staking tools on a common holder attached to the ram of a small arbor press, as shown in fig. 8.

In this setup, the assembled motor is held in position by a recessed fixture fastened to the bed of the press. The tool has a central pilot hole in a pin that fits over the motor shaft. This pin not only centers the tool positively in reference to the housing but presses the bearing cap (a flat stamping) firmly against its seat as the three chisel-edged staking tools force metal over the edge of the plate and hold the latter in position. With these two types of fastening, neither bearing can be removed without voiding the guarantee on the motor. After a small molded plastic brush holder with brushes in place has been installed and fastened with a single screw, the motor is ready for inspection and test.

Mexican Credit Approved

Washington

• • • **A credit of** $5 million to Nacional Financera, Inc., financial agency of the Mexican government, has been approved by the Export-Import Bank. The credit is to be used for the purchase of United States agricultural equipment, including tractors. Under terms of the loan, a 20 pct cash payment will be made on purchases and the remaining 80 pct will be paid in 10 semi-annual installments at 3½ pct interest.

Bethlehem Approved As WAA Plant Purchaser

Washington

• • • **Bethlehem Steel Co.** has been approved by War Assets Administration as purchaser of a surplus shell-casings plant at Johnstown, Pa. The $500,000 sale is contingent upon Justice Dept. opinion that it will not violate antitrust laws.

Bethlehem will use the former war plant for fabrication of railroad car frames, mine cars, road mats, long span steel joists and miscellaneous products.

The plant consists of a steel-frame manufacturing building with 123,941 sq ft of floor area, a concrete block oxygen house, a frame watchman's shelter, a 14-acre land site, and leasehold improvements including paving, water drain and sewer lines, electric sub-station, railroad track and fences.

The plant has a present appraised fair value of $673,138.

AIME Session Features Oxygens in Openhearths

Pittsburgh

• • • **Packed sessions** marked the annual off-the-record meeting of the American Institute of Mining and Metallurgical Engineers, held here recently. "Oxygen in the Openhearth," the theme of the meeting, was one reason observers gave for the heavy attendance.

J. D. Sullivan, Battelle Memorial Institute, headed up a session on refractory practice in the openhearth. Spectators concluded from the discussion following the meeting that there was, indeed, a tremendous difference in oxygen practice at various mills. Splashing and smoke were reported by one speaker, while another big steel company said it got no splashing. The latter producer also reported that compressed air does the same job as oxygen in carbon reduction from about 0.12 to about 0.15 C on down. This is accomplished, he said, without introducing nitrogen into the bath.

Other talks on the metallurgical aspects of oxygen were delivered by John Pollock, Jones & Laughlin Steel Corp., and Henry Warren, Carnegie-Illinois Steel Corp. These sessions were led by David Mc-

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For FINE GEARS

Bride, Bethlehem Steel Co., a R. C. Diehl, Wheeling Steel Co.

The Institute of Metals Di heard a number of excellent p pers on radioactive tracers metallurgy. The subject was i troduced by Dr. David Hallida University of Pittsburgh, who e plained how nuclear particles a produced and used.

Dr. W. E. Shoupp, Westinghous Research Laboratories, talked c equipment for measuring nucle particles in tracer work. Dr. C. Birchenall, Carnegie Institute Technology, reviewed the radi active tracer experiments bei conducted at Carnegie Institut which is believed to have the mo comprehensive radioactive trac program in the country. Co-chai man of this meeting were Dr. J. Berger, Molybdenum Corp. America, and J. K. Stanley, Wes inghouse Research Laboratories.

Western N.Y. Group Elect

Washington

• • • **The** Western New Yor chapter of the Institute of Scra Iron & Steel Inc., at its recen meeting in Buffalo, elected the fo lowing officers: president, D. Sloa Hurwitz, Hurwitz Bros. Iron Metal Co. Inc., Buffalo; vice president, Herman Schwart Rochester Scrap Baling Corp Rochester; secretary-treasure Leo Chapin, Chapin & Fagin, Inc Buffalo.

The following were elected t the executive committee: Jac Reingold, Lake City Iron & Meta Co. Inc., Buffalo; Milton Spiege W. M. Spiegel & Sons, Elmira N. Y.; J. Maher, Pennsylvani Wood & Iron Co., Inc., Buffalo Leonard Leventhal, Queen Cit Iron & Metal Co., Buffalo; Edwar A. Brown, Rochester Iron & Meta Co. Inc., Rochester.

Brass Mill Buys Plant

Washington

• • • **American Brass Co.** ha purchased for $948,070 the war time brass strip plant formerl operated by the Kenosha Bras Co. at Kenosha, Wis. The WA transaction included six acres o land, three buildings, and speci fied items of equipment. Th plant consists of a cold-rollin and annealing building, a single story press building, and a ho rolling mill.

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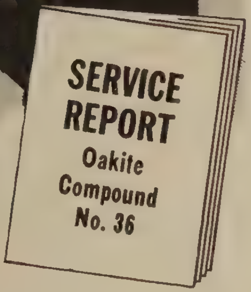

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British Planning Two New Blast Furnaces To Increase Output

London

• • • A Dorman Long project for the installation at their Cleveland works at Middlesbrough of a new blast-furnace plant at an estimated cost of $17.6 million is under consideration by the Iron and Steel Board.

The plan provides for two new blast furnaces, which will be the largest in the country, together with the necessary extension of gas cleaning and distribution plant, new railways and bridges.

The company's new open-hearth steelworks being built on the Lackenby site, in association with the beam mill, will be linked by private railway line with the Cleveland and Redcar works. Cleveland, Lackenby and Redcar works will have a combined maximum iron demand of approximately 22,000 tons per week. This is much greater than at any other British works.

Provision is made in the plan for feeding molten iron to the Lackenby steelworks and replacing much of the old, and today uneconomic, blast-furnace capacity at Cleveland works.

The site selected for the new blast furnaces extends over 48 acres, and will permit of the installation of the five or six blast furnaces that may be required eventually if the Lackenby site is developed to its maximum steelmaking and rolling capacity.

The new blast furnaces will be situated close enough to the central ore unloading and preparation plant now under construction, and the existing large coke oven batteries, for the raw materials to be delivered to the blast furnaces by belt conveyors. To meet the need for additional large capacity blowers the new boiler house plant will be almost doubled and all blast furnace gas will be effectively used at the Cleveland and Lackenby works.

Hot metal and slag ladles of 75 tons capacity requiring new large locomotives and rolling stock will be used to transport the molten iron between the blast furnaces and Lackenby (3 miles) and, when necessary, to Redcar (4½ miles).

The new furnaces will have a hearth diameter of approximately

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"AIROCOOL"
GAS BURNER NOZZLES
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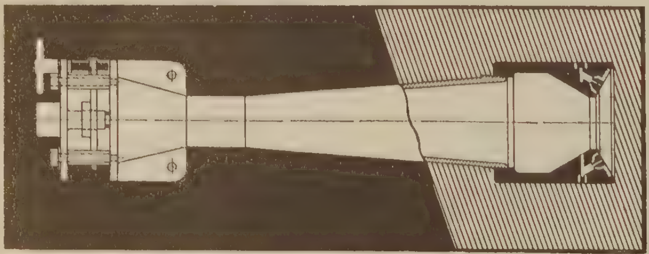

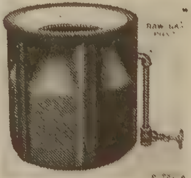

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and our "AIROCOOL" Nozzles have the deserved reputation of outlasting, under fire, two to five times, the ordinary flame retention nozzles. Consequently, they reduce, the frequent labor costs, inconvenience, and overhead item of making replacements. Renewable type recessed gas tips direct the separate igniter flames against the main volume of the mixture to insure stable ignition . . . and allow greater turndown without burn-back. "AIROCOOL" Nozzles are made exclusively by us. They are stocked for standard pipe thread sizes 4, 5, 6 and 8 inch for various makes of inspirators. Write for Supplement 3 to Bulletin 55 . . . it gives detailed information.

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27 ft., and an output of 7250 to 7500 tons of basic iron per week per furnace.

It is anticipated that the two new blast furnaces with the consequential extensive redevelopment of essential services can be completed within three years. The possibility of construction of a third blast furnace being undertaken before the two now approved are completed is envisaged by the company.

The project is directly in line with the national and North East Coast develpoment plans for the iron and steel industry.

French Steel Prices Advanced Following Cutting of Subsidies

Paris

• • • **Prices of French** iron and steel products have been advanced sharply (in some cases as much as 50 to 60 pct) as a result of the recent cut in government subsidies to the French iron and steel industry.

Usually well informed sources have stated that even these increases do not take into account the increase in coal and coke prices of 58 pct which has resulted from a similar cut in government subsidies to the nationalized coal mines. Nor do these increases, which are based on the prices of last March, reflect the 5 pct basic price increase authorized at the beginning of September.

A new schedule of scrap prices will follow closely the advances of pig iron and steel prices. The increase in scrap prices is expected to be about 50 pct. However, even at the advanced prices, French scrap will still be cheaper than United States or Belgian scrap. In spite of this, it is doubtful if any exports of French scrap, outside of those already authorized in trade agreements with Italy, will be approved by the government, although, under special conditions, some tonnage of North African scrap might be made available for export.

Following is a comparison of the old and new price schedules, along with the percent of increase. These prices are f.o.b.

works, and include the 1 pct sales tax, but not the production tax, or the 5 pct increase in basic price authorized in September. Extras are advanced.

Prices of French Iron and Steel (converted at the official rate of 119 francs = $1)

Metric Ton	Basic Price (Mar. 1, 1947)	Price Effective Nov. 6, 1947	Pct of Increase
Casting hematite pig iron	$42.86	$68.99	60
Refining hematite pig iron	42.27	68.99	63
Casting phosphorus pig iron	37.73	60.92	61
Refining phosphorus pig iron..90 pct of price of casting phosphorus pig iron			
Basic Bessemer Steel			
Semis for rerolling	$51.34	$73.53	43
Semis for forging	56.13	77.82	39
Rails	83.03	105.21	37
Wire rods	78.49	100.84	39
Strip	75.29	102.52	36
Thin sheets	100.50	158.53	44
Openhearth Steel			
Semis for rerolling	$55.04	$84.20	53
Semis for forging	60.08	91.09	52
Wire rods	83.45	115.88	39
Strip	80.50	119.24	46
Thin sheets	106.13	163.03	54

Philippines Buy Bridges

Washington

• • • The Philippine government is arranging for shipment of 13,000 tons of surplus railway bridges, following purchase from the War Assets Administration for approximately $1 million.

A total of 202 spans are included in the purchase, the first under a $10 million credit recently extended by WAA. Adaptable either for railway or highway traffic, the bridges were offered for sale domestically, but no interest was shown, WAA said. The purchase includes 165 spans of 70 ft and 37 spans of 123 ft.

Elected to NFA Council

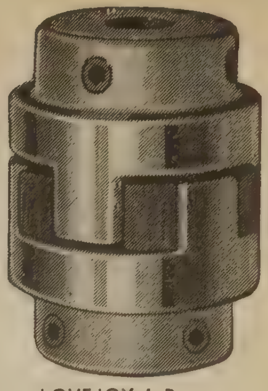
New York

• • • **E. C. Hoenicke**, general manager, Eaton Mfg. Co. Foundry Div., Detroit, and Ralph J. Teetor, president of Cadillac Malleable Iron Co., Cadillac, Mich., were elected to the administrative council of the National Founders Assn. at the fiftieth year annual meeting held recently in New York. Both Mr. Hoenicke and Mr. Teetor have served for 2 years on the association's regional committee.

Better correction of transmission "enemies":

(1) MISALIGNMENT
(2) SHOCK
(3) WHIP
(4) BACKLASH
(5) SURGE
(6) VIBRATION

LOVEJOY L-R Flexible Couplings



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If Sweet's File for the Mechanical Industries is not available in your office, please address request for application to:

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British October Steel Production Surpasses Former Output Record

London

• • • **Final detailed** figures of October pig iron and steel production issued by the British Iron and Steel Federation show that steel output last month exceeded the production of any previous monthly period. This new record production was at an annual rate of 14,316,000 tons, compared with 13,841,000 tons a year in September and 13,226,000 tons in October, 1946. The previous high was the March, 1943, rate of 14,310,000 tons annually.

Pig iron production also showed an increase to an annual rate of 8,352,000 tons compared with 7,805,000 tons in September and 8,102,000 tons a year ago.

The detailed statistics are set out below (long tons).

PIG IRON

	1946		1947	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
1st Quarter	145,000	7,566,000	134,400	6,989,000
2nd Quarter	150,500	7,827,000	141,600	7,363,000
3rd Quarter	146,600	7,622,000	146,700	7,628,000
September	147,300	7,660,000	150,100	7,805,000
October	155,800	8,102,000	160,600	8,352,000

STEEL INGOTS AND CASTINGS

	1946		1947	
	Weekly Average	Annual Rate	Weekly Average	Annual Rate
1st Quarter	242,600	12,617,000	216,000	11,231,000
2nd Quarter	252,100	13,111,000	244,100	12,694,000
3rd Quarter	230,000	11,953,000	235,400	12,241,000
September	238,500	12,402,000	266,200	13,841,000
October	254,300	13,226,000	275,300	14,316,000

NLRB Rules Against Unions for Ignoring The Taft-Hartley Act

Washington

• • • **In its first action of the** kind since enactment of the Taft-Hartley Act, the NLRB recently threw out election petitions by three unions because the unions had failed to take "any steps to comply with the registration and filing requirements" of the Act.

The dismissed petitions had been made by the United Steelworkers (CIO), the United Construction Workers (AFL), and the United Furniture Workers (CIO). The UCW is affiliated with the United Mine Workers.

In the opinion of the Board, that body is precluded "not only from initiating investigations after the effective date of the amendments but also from continuing investigations concerning representation" which were pending before the Board unless these requirements are met.

In the meantime, the Justice Dept. presented a memorandum to the Supreme Court requesting nullification of a former decision which had ordered Jones & Laughlin Steel Corp. to recognize the United Steelworkers as the bargaining agent for plant guards at the corporation's Otis works. Under the Act, unions admitting members other than guards, may not bargain for the guards.

At the same time, but in a separate case, the Justice Dept. advised the high court that the new Act did not set aside the power of the NLRB to order reinstatement of two foremen who had been discharged by the Vail Manufacturing Co.

Solicitor Philip B. Perlman contended that the foremen had been discharged because of refusal to engage in a "fraudulent plan" for participation in an election among nonsupervisory employees. The NLRB finding, he said, was not based upon the status of the two workers as foremen but entirely upon the need to protect employees from coercion.

Former WAA Aluminum Pig Plant Reopens at Tacoma

Tacoma, Wash.

• • • **Operations** at the Tacoma, Wash., aluminum pig plant of the Permanente Metals Co. have begun with the initial delivery of power from the Bonneville-Grand Coulee power plants. This is the last of the war-built aluminum reduction plants in the Pacific Northwest to re-open.

A large part of the output from the Tacoma plant will go to the Permanente mill at Spokane for rolling into sheet, circle and coil, Bonneville Power Administrator Paul J. Raver said, in announcing that power for the mill has been turned on.

With the exception of the Reynolds Metals Co. reduction plant at Longview, Wash., which is closed down temporarily, Raver said, all aluminum capacity in the region is being utilized.

He added that he had been advised by Permanente that the company plans to spend approximately $1 million in improvements for the Tacoma plant which it purchased from WAA for $3 million.

Canadian Firms Receive Orders for Locomotives

Montreal

• • • **Negotiations** have been completed with representatives of the government of India, whereby Canadian Locomotive Co., Kingston, and the Montreal Locomotive Works, Montreal, receive contracts for building 150 locomotives, representing a cost of approximately $13,500,000.

Montreal Locomotive Works received an order for 90 locomotives and Canadian Locomotive Co. will build 60 locomotives. This is the third contract placed with Canadian companies for locomotives by the Government of India. In 1944 an order was placed for 145 engines, valued at $11 million and in 1946 orders were placed for 292 engines representing cost of about $22 million.

With the new India orders, the two companies referred to above now have sufficient business on their books to absorb full production of the plants well into 1949.

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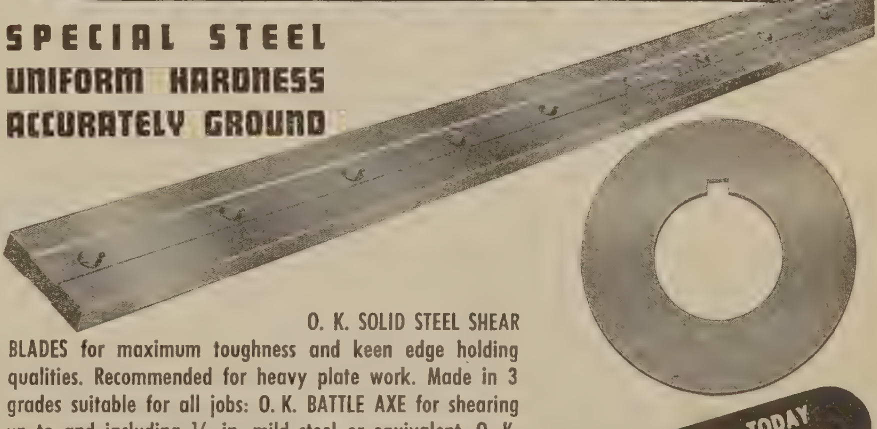

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MACHINE TOOLS

. . . News and Market Activities

Price Increases, Tightening Orders Dim Machine Tool Prospects

• • • **A rash of** price increases and a general tightening of new firm orders, a pair of parallel developments of sufficient caliber to provide the pessimists with fodder for the firing line, were reported by major segments of the machine tool industry this week.

Most of the price increases reported thus far have been on show machines; prices of some general purpose machines have also been increased, either 10 or 15 pct; trade sources believe that a majority of the other producers will shortly follow suit.

At the same time, new firm orders have fallen off sharply within the last few days, and with October shipments of $27,545,000, second highest monthly level of 1947 to date, the backlog of unfilled orders now stands at about $113,874,000, lowest level of the year to date. It follows that machine tool builders are shipping heavily against backlog, and that there is some basis for the disappointment in October performance some sectors are frank to express.

For many segments of the industry, November started out to be a very good month, but the bottom suddenly dropped out in the last two weeks, and standard, general purpose machines are moving very slowly in many areas.

The general volume of business in the machine tool industry is such that machines are being made, in many cases, the most expensive way possible, which may in part explain the price increases. At the same time, some observers believe a general wage increase is in sight for early spring, which machine tool builders will probably have to meet. A price increase may also be of some assistance here.

Other sources in the trade believe that this is no time to raise prices, taking the line of reasoning that if a producer can't sell machine tools at present prices, it is unlikely that they can be sold at 10 or 15 pct more. The November figures may be the deciding factor in a number of cases.

Many Producers Oppose, And Even Fear, Additional Price Increases

° ° °

In Detroit, most segments of the machine tool industry appear to be marking time at the moment. While quotations have recently been requested by several large auto firms for extensive tooling programs, no releases of importance have been reported during the past week.

At the moment tool and die shops are reported as showing considerable interest in boring mills and planers and some scattered orders for tool room equipment have been placed.

Meanwhile, deliveries are reported as "getting worse every day," and there are definite indications that the 1948 model programs of several car builders will be delayed by late deliveries of essential machine tools.

In a recent publication by the UAW-CIO, considerable attention was given to what the union called workers' attention to machines weighing 55 tons, which stand 13 ft high and which "juggle six auto operations a minute." The publication also charged that machine tool builders are "selling their wares" on the basis of how many workers they displace.

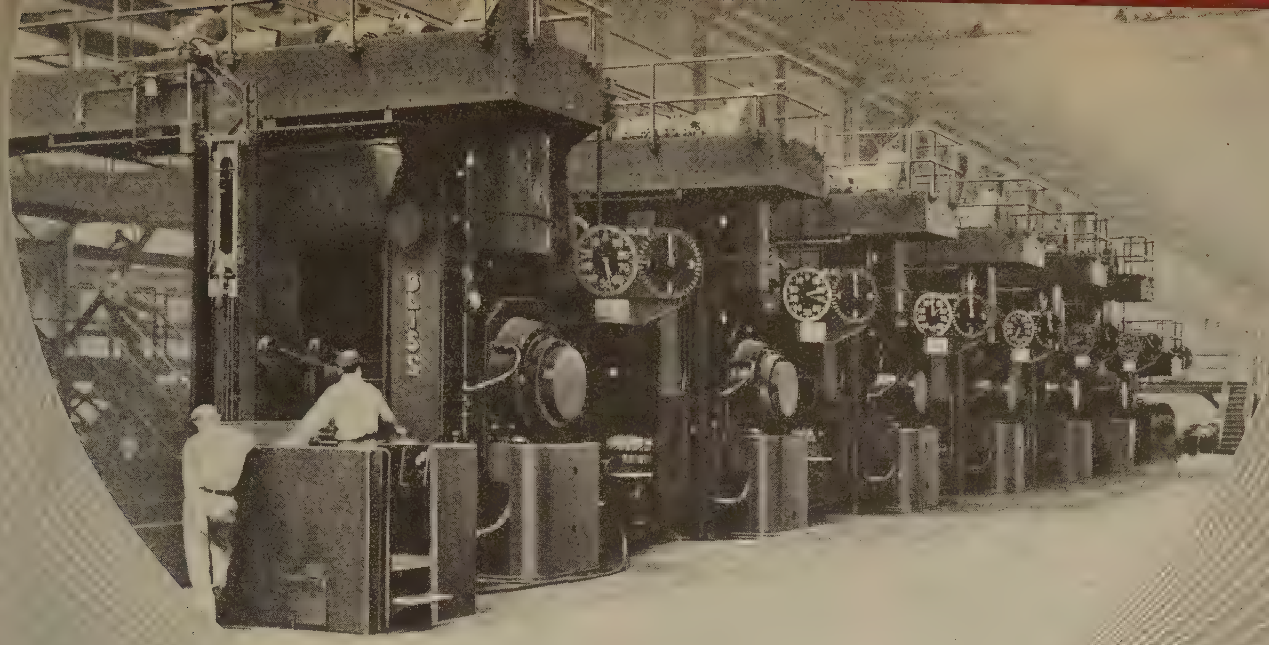
The concluding line of the article left no doubt as to the position the union plans to take with respect to new labor-saving machines: "Another beaut is a $75,000 job which weighs 42½ tons and cuts teeth in gears. The company boasts that it's really 'ten machines in one' and that 'a single operator runs it!'"

In Chicago, while many machines tool buyers have used up their 1947 appropriations, sellers of machines report they are expecting a good order volume in December. The brisk pickup following the show is regarded here as partly due to buyers holding off to see what the new designs had to offer, and that the machinery at the show itself was not the sole factor in increasing order volume.

Within the past 2 weeks a 15 pct price increase on general purpose machines has been effected by three large makers and the trade reports they expect the other builders to follow suit very soon. A large Ohio manufacturer is concerned over the price level of its product. Last week this company experienced a 5 pct price increase in castings and the builder has decided to try to absorb the higher cost, as he is fearful any more price increases on his products will meet with strong buyer resistance.

In the East, in sharp contrast to other areas, more sales were reported the past week than in the previous week. There has been no sudden rush of business, but the trade apparently is optimistic. Some heretofore hesitant prospects have signed for immediate or early 1948 delivery.

MARKET CHIPS . . . Present indications are that there will be very few machine tools changing hands under the Marshall Plan; Europe will get primarily food, raw materials and transportation equipment . . . In most sectors, tool and die shops are busy and have quite a lot of orders on their books . . . The lathe business is holding up pretty well, and deliveries are 12 to 16 weeks in many cases . . . Industrial mobilization is a very hush-hush subject around official circles these days . . . According to the Dept. of Commerce, estimates of the percentage of Argentine machine tool imports furnished by the different countries of origin in 1946 and the first 8 months of 1947 include: the U. S. 40 pct; Czechoslovakia 16 pct; Italy 10 pct; Sweden 9 pct; England and Belgium 8 pct each; Switzerland 5 pct; Brazil 3.7 pct and France 0.3 pct.



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NONFERROUS METALS

. . . News and Market Activities

Copper

• • • Producers report that demand continues very strong. Books for January sales are expected to be opened during the week. Kennecott is spreading its loss of production during the 3-week railway workers' strike at the Utah mine over deliveries during the 3-month period from December through February. Consumers are reported to be desperately seeking to place their business for early delivery date. The price is firm at quoted levels. Wire mill demand is very strong, according to reports. Brass mill demand is reported to be gradually improving in volume.

•

Lead

• • • Producers report that consumer requests for lead are urgent and there are reports of a number of plants that may be forced to close down unless lead for early delivery is obtainable. There is a report that Canadian shipments into the United States have declined in recent months, which would be sure to aggravate a situation that is already critical. Producers expect to open January books next week.

•

Metals Scrap Scarce

New York

• • • Scrap dealers report no change in scrap prices from previously quoted levels. However, they say that scrap intake seems to be declining and attribute this development to the anticipation of higher prices by scrap collectors and producers. The scarcity of new collections of scrap is reported to apply to all metals including copper and composition red metals, aluminum, lead and even zinc.

Tin

• • • Although the time of the year is at hand when it might be presumed that negotiations were underway to fix the price the United States is to pay for Bolivian concentrates during 1948, there have been no discussions between RFC officials and Bolivian mine owners, according to a responsible source. So far there has been no indication of the asking price which the Bolivians will start with. According to reports, some individual producers have mentioned a price of $1.00 per lb of tin contained in concentrates as compared with the present basic price of 76¢. Whether this initial asking price will be the one presented by a meeting of producers remains to be seen.

The price agreed on by RFC and Bolivian producers will serve to set the world market price shortly after its announcement. This is because the price of Patino high grade Bolivian concentrates which go to the United Kingdom is tied to the price paid by the United States. Together high and low grade Bolivian concentrates represent some 40 pct of total world production of tin.

The importation of the low grade Bolivian concentrates is essential for the continued operation of the government tin smelter at Texas City, Tex., which produces the major portion of the fine tin for domestic consumers. On the other hand these low grade concentrates can not be handled by any other smelter in the world. In order to continue the smelter in operation, particularly in the present short supply position for tin, it is necessary for RFC to set a price for concentrates which will assure profitable mine operating conditions. Operation of the Texas City smelter has been authorized until Mar. 31, 1949.

Monthly Average Prices

• • • The average prices of the major nonferrous metals in November based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	21.50
Lake copper, Conn. Valley	21.625
Straits tin, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Lead, St. Louis	14.80
Lead, New York	15.00

Nonferrous Metals Prices

Cents per pound

	Nov. 26	Nov. 27	Nov. 28	Nov. 29	Dec. 1	Dec. 2
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

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Zinc Output Rises

Ottawa

• • • Canadian production of lead in September totaled 13,261 tons compared with 13,612 tons in August and 14,380 tons in September 1946. For the first 9 months of this year production totaled 120,671 tons against 137,881 tons in the corresponding period last year.

Production of zinc in September amounted to 17,912 tons against 16,709 tons in August and 19,127 tons in September last year. For the first 9 months of this year zinc output totaled 157,206 tons compared with 180,298 tons in the like period of 1946.

Raise Ingot Prices

New York

• • • Increases in the prices of some grades of brass and bronze ingots have been announced by Federated Metals Div. American Smelting & Refining Co. effective Nov. 24. The increases took place in gunmetal bronzes of the 88-10-2 classification, aluminum bronze and some manganese bronze compositions. Other grades remained unchanged. The increases were made necessary by higher scrap prices prevailing.

NONFERROUS METALS PRICES

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$35.50
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$80 to $82
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$62 to $65
Silver, New York, cents per oz.	74.625
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Zirconium copper, 6 pct Zr. per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	18.00
No. 120	17.50
No. 123	17.00
80-10-10 ingot	
No. 305	22.00
No. 215	20.00
88-10-2 ingot	
No. 210	28.25
No. 215	26.25
No. 245	21.75
Yellow ingot	
No. 405	14.50
Manganese Bronze	
No. 421	18.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75-16.00
0.60 copper, max.	15.50-15.75
Piston alloys (No. 122 type)	15.25-15.50
No. 12 alum. (No. 2 grade)	14.75-15.00
108 alloy	15.00-15.25
195 alloy	15.50-16.00
AXS-679	15.00-15.50

Steel deoxidizing aluminum, notch-bar, granulated or shot

Grade 1—95 pct-95½ pct	14.75-15.00
Grade 2—92 pct-95 pct	13.75-14.00
Grade 3—90 pct-92 pct.	13.25-13.50
Grade 4—85 pct-90 pct.	12.75-13.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33⅝
Zinc, Cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75-S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness; 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢ 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢ 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅜, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per pound, f.o.b. mill effective June 11)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16 —16½
No. 2 heavy copper and wire	15 —15½
Light copper	13½—14
Auto radiators (unsweated)	8¾— 9¼
No. 1 composition	11½—12
No. 1 composition turnings	11 —11½
Clean red car boxes	9½—10
Cocks and faucets	9¼— 9¾
Mixed heavy yellow brass	7 — 7½
Old rolled brass	7½— 8
Brass pipe	8¾— 9¼
New soft brass clippings	11½—12
Brass rod ends	9 — 9½
No. 1 brass rod turnings	8½— 9

Aluminum

Alum. pistons with struts	4½— 5
Aluminum crankcases	6 — 6½
2S aluminum clippings	9 — 9½
Old sheet & Utensils	6 — 6½
Mixed borings and turnings	— 2
Misc. cast aluminum	5½— 6
Dural clips (24S)	5 — 5½

Zinc

New zinc clippings	6 — 6½
Old zinc	4½— 5
Zinc routings	2½— 3
Old die cast scrap	2½— 3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	7½— 8
Nickel silver turnings, mixed	5½— 6

Lead

Soft scrap lead	10¾—11¼
Battery plates (dry)	6 — 6½

Magnesium Alloys

Segregated solids	6½— 7
Castings	4½— 5½

Miscellaneous

Block tin	63 —65
No. 1 pewter	48 —50
No. 1 auto babbitt	38 —40
Mixed common babbitt	11½—12
Solder joints	14½—15
Siphon tops	38 —40
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	10 —10½
New type shell cuttings	11 —11½
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5½
Electro dross	3¼— 3½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends.. List	+42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules ... List	+42%
Lead wool	19.50

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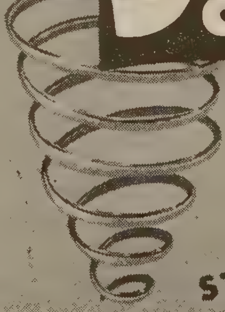
- ANY GRADE
- ANY TIME

Scrap Service Schlossberg

OPEN HEARTH
FOUNDRY
BLAST FURNACE
ELECTRIC FURNACE



STEEL
ALUMINUM
IRON
STAINLESS
ALLOY

DIRECT MILL OR YARD SHIPMENT

MAX SCHLOSSBERG CO. 33 NO. LA SALLE, CHICAGO FRA. 0380

Continued Severe Testing Slows Market

New York

• • • **The** price testing period in the market became serious this week, and the market for No. 1 heavy melting steel grades has virtually dried up in major consuming centers. Dealers and brokers continue to be hesitant at present mill offers, but some are still doing business on old higher-priced orders that were originally scheduled to be canceled Nov. 22.

Certain of those orders were extended, and some reports indicate that they may be good until the middle of this month. Other mills are standing pat on lower offers and transacting relatively small tonnages on that basis.

Most reports indicate that the dealers are not too anxious to do much more business this year, but it is likely that the mills will have to come into the market again before the end of the year.

In the face of a weaker tendency on the part of the steelmaking scrap market, the cast grades were definitely up this week. No. 1 cast increases were registered in Pittsburgh, Cleveland, New York, and Birmingham. Foundries were continuing to purchase cast grades at mounting prices, particularly in areas where the possibility of blast furnace shutdowns threatened already critical pig iron supplies.

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PITTSBURGH—Price activity over the past week was confined to cupola cast and rails. The former advanced $1.50 to $54 while rails 2 ft and under were up $1 to $54 to $55. Foundries that have been paying far more than steel mills for R.R. heavy melting scrap may drop their bids. They have paid as much as $6 more than mills for this material. Dealer activity has fallen off and brokers are mainly filling shortages. Most local mills report inventories at least sufficient to last out the year. Renewed activity is expected in the openhearth market in January. Most observers predict little activity for the balance of the year. With winter at hand and dealer incentive low, any mill demand for free market openhearth scrap this month would mean a sharp test for the $40 price.

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CHICAGO — The little new business transacted last week was based at the mills' price, but so far the market here has not really been tested. Many observers report that there is evidence that all the high priced orders were not cancelled on Nov. 22, and in fact there is a good possibility that some of these orders were extended. All the trade admits the market is still very strong if viewed on a normal supply and demand basis. The dealers for the most part aren't too interested in shipping any more scrap until after the first of the year, but it's a lead pipe cinch the mills will have to buy again before that time.

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PHILADELPHIA — Heavy melting grades are quoted $1 lower this week in the absence of information on new mill commitments at higher prices. Brokers are reported to be buying at $41.50 f.o.b. Philadelphia and $42.50 delivered. The price spread for machinery cast is increased by adding $1 to the high side. Other grades remain unchanged. Dealers report that there has been a decline in the volume of unprepared scrap coming into yards in recent weeks. Scrap volume on old orders is reported to be fair, but mills are unable to build their inventories.

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CLEVELAND — Customer scrap continues to move here and in the Valley to consumers plants at "formula" prices. Free or unearmarked scrap is becoming increasingly scarce, and the trade is showing some reluctance to take orders at the $40 level for anything but open tonnages. First testing of prices is taking place this week under very unfavorable conditions for holding the line. Foundry grades are running wild. It is now apparent to all concerned that mills selected the worst possible time for setting up "formula" prices, which since their inception have shaken rather than steadied the market.

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DETROIT — Scrap prices are holding according to "formula" in Detroit at present although most dealers appear to be reluctant to move scrap at present prices. However, actual sales of heavy melting grades at these prices have been reported. Present indications are that if the price line holds low phos grades will eventually settle down at $5 over the No. 1 hvy melting price. Machine shop and short shovel turnings are holding at last week's price although the demand for No. 1 cupola cast continues to exceed supply by a substantial margin. As some sources view the market, with mills reported to be in a fairly comfortable position, it appears that the real showdown on scrap prices may not come until January.

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BUFFALO — Brisk demand for cast scrap was the shining light in an otherwise drab market. Buying was largely in anticipation of the shutdown of one of the district's merchant iron furnaces for relining in the first quarter, possibly in January. One leading foundry purchased between 2000 and 3000 tons at $50 and competition for limited supplies was expected to increase sharply in the next few weeks. The situation in openhearth grades was unchanged, with mills holding to the $39.25 price line and dealers remaining on the side lines.

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NEW YORK—Despite the extension of certain old high priced orders to the end of this week and possibly beyond, new business was being transacted at $37 to $37.50 for No. 1 heavy melting steel scrap. Other brokers were offering below this level, but there was no clear evidence that any scrap was obtainable at lower levels. The amount of business being transacted remained small.

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BOSTON—The market has yet to find itself. Brokers have been filling old orders supposed to have been cancelled Nov. 22, paying $36 a ton on cars for heavy steel. One mill will pay $31.90 f.o.b. for heavy steel, up 90¢ from its previous bid, but the trade is laughing this off. Cast continues in good demand, light supply, firm and unchanged in price.

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ST. LOUIS — The market for heavy melting steel is unchanged, as mills in the St. Louis industrial district have established the same prices for December as for the preceding month. While dealers expected an increase, the mills are buying at the offered prices, although in limited quantities. Sellers are shipping in small lots, hoping for a better market. Foundry grades are strong, and some items are higher. Railroad lists: Wabash 2500 tons, Missouri Pacific 1900 tons.

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CINCINNATI — The market here this week remains at about the same level of activity as during the past week. While there is strong demand for all grades, there is not the supply to satisfy the demand. Prices are the same as last week with the mills' offering price finding few suppliers.

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BIRMINGHAM—Dealers and mills in this area still are deadlocked on openhearth grade prices. Dealers are showing no indication of retreating from their contention that the $37 mill offer is too low. Mills, holding that they are in a fairly comfortable position insofar as inventories are concerned, have made no move to raise the $37 figure. Terrific demand for cast grades continues, and substantial tonnage of No. 1 cupola cast have been purchased at $51, ad advance of $4.

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TORONTO—With winter conditions and several inches of snow covering the rural districts, scrap iron and steel receipts fell into a general slump and were reflected in slowing of deliveries to consuming plants during the past week. Local dealers now are depending almost entirely on industrial plants for scrap supply. The supply situation is steadily becoming more critical and much depends on importation if Canadian mills are to maintain their present high steel making schedules. Price advances announced several weeks ago have had comparatively little effect toward stimulating offerings and no special effort was made this Fall to bring in supplies from rural districts. Cast scrap continues scarce, while other iron grades are almost entirely off the market.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00
RR. hvy. melting	40.50 to 41.00
No. 2 hvy. melting	40.00
RR. scrap rails	49.00 to 50.00
Rails 2 ft. and under	54.00 to 55.00
No. 1 comp'd bundles	40.00
Hand bdld. new shts.	40.00
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	36.50 to 37.00
Mixed bor. and turn.	35.00 to 35.50
Cast iron borings	35.50 to 36.00
No. 1 cupola cast.	53.00 to 54.00
Hvy. breakable cast.	40.00 to 40.50
Malleable	57.00 to 58.00
RR. knuck, and coup.	52.00 to 53.00
RR. coil springs	52.00 to 53.00
RR. leaf springs	52.00 to 53.00
Rolled steel wheels	52.00 to 53.00
Low phos.	47.00 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	38.50 to 39.00
No. 2 dealers' bundles	38.50 to 39.00
Bundled mach. shop turn.	38.50 to 39.00
Galv. bundles	36.50 to 37.00
Mach. shop turn.	33.50 to 34.00
Short shov. turn.	35.50 to 36.00
Cast iron borings	34.50 to 35.00
Mix. borings & turn.	33.50 to 34.00
Low phos, hvy. forge	44.00 to 48.00
Low phos, plates	41.50 to 45.00
No. 1 RR. hvy. melt.	41.25 to 46.00
Rerolling rails	59.00 to 60.00
Miscellaneous rails	50.00 to 51.00
Angles & splice bars	50.00 to 51.00
Locomotive tires, cut	49.00 to 50.00
Cut bolster & side frames	48.00 to 48.50
Standard stl. car axles	55.00 to 56.00
No. 3 steel wheels	49.00 to 50.00
Couplers & Knuckles	48.00 to 50.00
Rails 2 ft. and under	55.00 to 56.00
Malleable	65.00 to 66.00
No. 1 mach. cast.	53.00 to 54.00
No. 1 agricul. cast.	49.00 to 50.00
Hvy. breakable cast.	41.00 to 43.00
RR. grate bars	47.00 to 48.00
Cast iron brake shoes	48.00 to 49.00
Cast iron carwheels	45.50 to 46.50

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 bundles	38.00 to 40.00
No. 2 bundles	38.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Shoveling turn.	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	49.00 to 50.00
No. 1 cupola cast.	51.00 to 53.00
Hvy. breakable cast.	42.00 to 43.00
Scrap rails	47.00 to 48.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy melting	$35.00 to $36.00
No. 2 hvy. melting	35.00 to 36.00
Nos. 1 and 2 bundles	35.00 to 36.00
Busheling	35.00 to 36.00
Shoveling turn.	31.50 to 32.00
Machine shop turn.	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
Cl'n cast. chem. bor.	33.00 to 34.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	40.00 to 41.00
Stove plate	39.00 to 40.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$34.75 to $35.25
No. 2 hvy. melting	34.75 to 35.25
No. 1 bundles	34.75 to 35.25
New busheling	34.75 to 35.25
Flashings	34.75 to 35.25
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.50 to 30.00
Low phos. plate	41.75 to 42.25
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	40.00 to 41.00
Stove plate	40.00 to 41.00
Automotive cast.	46.00 to 47.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.50 to $42.50
No. 2 hvy. melting	41.50 to 42.50
No. 1 bundles	41.50 to 42.50
No. 2 bundles	41.50 to 42.50
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	35.00 to 36.00
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	39.00 to 41.00
No. 1 machinery cast.	52.00 to 55.00
No. 1 mixed yard cast.	49.00 to 50.00
Hvy. breakable cast.	49.00 to 50.00
Clean auto cast.	52.00 to 54.00
Hvy. axle forge turn.	43.50 to 44.50
Low phos. plate	47.00 to 48.00
Low phos. punchings	47.00 to 48.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	60.00 to 65.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	32.00 to 33.00
Locomotive tires, uncut	45.00 to 46.00
Mis. std. sec. rails	50.00 to 51.00
Rerolling rails	56.00 to 59.00
Steel angle bars	48.00 to 49.00
Rails 3 ft. and under	53.00 to 55.00
RR. steel springs	46.00 to 47.00
Steel car axles	46.00 to 48.00
Grate bars	44.00 to 45.00
Brake shoes	46.00 to 47.00
Malleable	60.00 to 61.00
Cast iron car wheels	46.00 to 47.00
No. 1 machinery cast.	48.00 to 50.00
Hvy. breakable cast.	39.00 to 40.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	37.00 to 38.00
Long turnings	23.00 to 24 00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	50.00 to 51.00
Stove plate	43.00 to 44.00
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Rerolling rails	48.00 to 49.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	40.00 to 42.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Short shov. turn.	36.50 to 37.00
Cast iron borings	35.50 to 36.00
Low phos	47.00 to 47.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $37.50
No. 2 hvy. melting	37.00 to 37.50
No. 2 bundles	37.00 to 37.50
Comp. galv. bundles	35.00 to 35.50
Mach. shop turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	45.00 to 46.00
Charging box cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Clean auto cast.	45.00 to 46.00
Unstrip. motor blks.	42.50 to 43.00
Cl'n chem. cast bor.	33.50 to 34.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	39.00 to 40.00
Mach. shop turn.	32.50 to 33.50
Shoveling turn.	34.50 to 35.50
Cast iron borings	31.50 to 32.50
Mixed bor. & turn.	31.50 to 32.50
No. 1 cupola cast.	48.00 to 50.00
Charging box cast.	46.00 to 48.00
Stove plate	47.00 to 49.00
Clean auto cast.	48.00 to 50.00
RR. Malleable	60.00 to 65.00
Small indl. malleable	45.00 to 47.00
Low phos. plate	44.00 to 45.00
Scrap rails	47.00 to 48.00
Rails 3 ft. & under	50.00 to 52.00
RR. steel wheels	46.00 to 48.00
Cast iron carwheels	46.00 to 48.00
RR. coil & leaf spgs.	46.00 to 48.00
RR. knuckles & coup.	46.00 to 48.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 1 busheling	39.00 to 39.50
Drop forge flashings	39.00 to 39.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	36.00 to 36.50
Steel axle turn.	39.00 to 39.50
Cast iron borings	35.00 to 35.50
Mixed bor. & turn.	34.00 to 34.50
Low phos.	44.00 to 44.50
No. 1 machinery cast.	56.00 to 60.00
Malleable	65.00 to 68.00
RR. cast.	57.00 to 58.00
Railroad grate bars	48.00 to 50.00
Stove plate	52.00 to 54.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft. & under	57.00 to 58.00
Rails 18 in. & under	58.00 to 60.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	25.00
No. 2 bales	25.00

Per gross ton delivered to consumer:

No. 3 bales	$19.50
Mach. shop turn.	16.00
Elec. furn. 1 ft. und	$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$25.50
No. 2 hvy. melting	25.50
No. 1 bales	25.50
No. 2 bales	25.50
No. 3 bales	19.50
Mach. shop turn.	17.50
No. 1 cupola cast.	$36.00 to 40.00
RR. hvy. melting	26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$24.00 to $26.50
Elec. furn. 1 ft. and und.	27.50 to 30.00
No. 1 cupola cast.	27.50
RR. hvy. melting	25.00 to 26.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact., prep'd	21.00*
Bushelings, new fact., unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	36.00 to 40.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-rolled Steel: (cents per pound)	Dec. 2, 1947	Nov. 25, 1947	Nov. 4, 1947	Dec. 3, 1946
Hot-rolled sheets	2.80	2.80	2.80	2.425
Cold-rolled sheets	3.55	3.55	3.55	3.275
Galvanized sheets (10 ga.)	3.95	3.95	3.95	4.05*
Hot-rolled strip	2.80	2.80	2.80	2.45
Cold-rolled strip	3.55	3.55	3.55	3.05
Plates	2.95	2.95	2.95	2.50
Plates wrought iron	6.85	6.85	6.85	4.112
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.30
*24 gage				
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.50
Cold-finished bars	3.55	3.55	3.55	3.10
Alloy bars	3.30	3.30	3.30	2.92
Structural shapes	2.80	2.80	2.80	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.05
Wire nails	4.25	4.25	4.25	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$43.39*
Light rails	3.10	3.10	3.10	49.18*
*per net ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$39.00
Sheet bars	66.00	66.00	66.00	38.00
Slabs, rerolling	45.00	45.00	45.00	39.00
Forging Billets	55.00	55.00	55.00	47.00
Alloy blooms, billets slabs	66.00	66.00	66.00	58.43
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.30
Skelp	2.60	2.60	2.60	2.05

Pig Iron: (per gross ton)	Dec. 2, 1947	Nov. 25, 1947	Nov. 4, 1947	Dec. 3, 1946
No. 2, foundry, Phila.	$40.97	$40.97	$41.36	$30.43
No. 2, Valley furnace	36.50	36.50	36.50	28.50
No. 2, Southern Cin'ti	40.24	40.24	40.24	27.80
No. 2, Birmingham	34.88	34.88	34.88	24.88
No. 2, foundry, Chicago†	36.00	36.00	36.00	28.50
Basic del'd Philadelphia	40.47	40.47	40.86	29.93
Basic, Valley furnace	36.00	36.00	36.00	28.00
Malleable, Chicago†	36.50	36.50	36.50	28.50
Malleable, Valley	36.50	36.50	36.50	28.50
Charcoal, Chicago	56.04	56.04	56.04	42.34
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	*$40.00*	$40.00	$42.50	$25.25
Heavy melt'g steel, Phila.	*42.00*	43.00	42.50	24.50
Heavy melt'g steel, Ch'go	38.75	38.75	39.50	25.25
No. 1, hy. comp. sheet, Det.	34.75	34.75	34.75	22.32
Low phos. Youngs'n	47.25	47.25	46.25	27.75
No. 1, cast, Pittsburgh	53.50	52.00	48.50	29.00
No. 1, cast, Philadelphia	53.50	53.00	53.00	40.50
No. 1, cast, Chicago	52.50	52.50	52.50	37.75
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$8.75
Foundry coke, prompt	14.00	14.00	14.00	8.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	19.50
Copper, Lake, Conn.	21.625	21.625	21.625	19.625
Tin, Straits, New York	80.00	80.00	80.00	70.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	11.65
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	23.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Dec. 2, 1947	3.18925¢ per lb.	$36.96 per gross ton	$40.25 per gross ton
One week ago	3.18925¢ per lb.	$36.96 per gross ton	$40.58 per gross ton
One month ago	3.19141¢ per lb.	$36.96 per gross ton	$41.50 per gross ton
One year ago	2.70711¢ per lb.	$28.13 per gross ton	$25.00 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1947	3.18925¢ Aug. 12	2.87118¢ Jan. 7	$37.35 Aug. 10	$30.14 Jan. 7	$42.58 Oct. 28	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1941	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1940	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1939	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1938	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1937	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1936	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1935	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1934	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1933	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1932	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1931	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1930	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1929	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over, (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Spot market as high as $92 gross ton or higher. (17) Delivered Los Angeles: add ½¢ per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) $2 more, (21) $1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

													DELIVERED TO		
Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Franc'co, Los Angeles, Seattle	Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling					($36.00 f. o. b. mill)		(Spot market as high as $86 to $90 gross ton)								
Carbon, forging	$46.00														
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS															
Carbon, rerolling [18]	$45.00[19]	$45.00[19]	$45.00[19]	$47.00	$45.00[19]	$45.00[19]							$48.00[19]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.00		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)						$69.00		
SHEET BARS[16]							$66.00								
PIPE SKELP	2.60¢[21]	2.65¢					2.60¢[21]								
WIRE RODS	2.80¢[21]	2.80¢[21]		2.80¢[21]	2.85¢		(Worcester = 2.90¢[21])					3.52¢[13]			
SHEETS															
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	3.175¢	(Ashland, Ky. = 2.80¢)		3.54[17]¢	2.95¢	3.12¢	3.02¢
Cold-rolled[1]	3.55¢	3.55¢	3 55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	4.00¢	3.97¢
Galvanized (10 gage)	3.95¢[23]	3.95¢[23]	3.95¢[23]		3.95¢[23]		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62¢[17]		4.27¢	4.17¢
Enameling (12 gage)	3.95¢[22]	3.95¢[22]	3.95¢[22]	3 95¢			3.95¢		4.05¢	3.95¢			4.10¢[22]	4.42¢	4.37¢
Long ternes [2] (10 gage)	4.05¢[24]	4.05¢[24]	3.85¢											4.52¢	4.47¢
STRIP															
Hot-rolled [3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[17]	2.95¢	3.27¢	3.22¢
Cold-rolled [4]	3.55¢	3.65¢		3.55¢			3.55¢			(Worcester = 3.75¢)			3.70¢	4.02¢	3.97¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.57¢	
TINPLATE															
Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85	(Warren, Ohio = $5.75)				$6.175	$6.074
Electro, box 0.25 lb.	Deduct 90¢ from standard coke base box price.														
Electro, box 0.50 lb.	Deduct 70¢ from standard coke base box price.														
Electro, box 0.75 lb.	Deduct 50¢ from standard coke base box price.														
BLACKPLATE, 29 gage[5]	3.90¢	3.90¢	3 90¢		4.00¢			4.00¢	4.00¢					4.32¢	4.22¢
BLACKPLATE, CANMAKING															
55 lb. to 70 lb.	Deduct $1.55 from standard coke base box.														
75 lb. to 95 lb.	Deduct $1.65 from standard coke base box.														
100 lb. to 118 lb.	Deduct $1.55 from standard coke base box.														
TERNES, MFG., Special coated	Deduct 85¢ from standard coke base box price.														
BARS															
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[17]	3.05¢	3.35¢	3.32¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[17]		3.07¢	2.97¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	4.00¢	3.97¢
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.45¢		3.45¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢							4.25¢		
PLATE															
Carbon steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.15¢, Claymont = 3.30¢, Geneva, Utah = 3.10¢) 2.95¢				3.76¢[14]		3.27¢	3.17¢
Floor plates	4.20¢	4.20¢												4.67¢	4.62¢
Alloy	3.80¢	3.80¢			(Coatesville = 4.50¢)									4.27¢	4.22¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.02¢	2.95¢
SPRING STEEL, C-R															
0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9]															
Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		3.99¢	3.97¢
Galvanized					Add proper size extra and galvanizing extra to Bright Wire Base										
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢)				(Trenton = 4.85¢)			5.28¢[13]		5.04¢	4.96¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.72¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel No. 304	Chromium Nickel No. 302	Straight Chromium No. 410	Straight Chromium No. 430	Straight Chromium No. 442	Straight Chromium No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation		Subject to negotiation			
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation		Subject to negotiation			
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation		Subject to negotiation			
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt, Beth	Subject to negotiation		Subject to negotiation			
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	*Cr*	*V*	*Mo*	*Co*	*Base Per lb*
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45
	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Pittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	*Plate*	*Sheet*
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	*Delivered San Francisco*
Standard & coated nails	$4.25†	$5.33
Galvanized nails‡‡	4.00†	5.03
Cut nails, carloads, Pittsburgh base	5.80*	....

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† 10¢ additional at Cleveland, 35¢ at Worcester. ‡‡ Plus $2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.21
Annealed galv. fence wire	4.65‡	5.66

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column	
Woven wire fence*	91	114
Fence posts, carloads	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire	101	...

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* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Cold-rolled	....	....	....	....	....	....	....	....	....
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv,
½-in.	50½	34½
¾-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in,	58	43½
Wrought Iron, buttweld		
½-in.	+ 7	+29
¾-in.	2½	+19
1 and 1¼-in.	8	+11
1½-in.	13½	+ 7½
2-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
½-in.	49½	35
¾-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
½-in.	+ 2½	+23
¾-in.	3½	+17
1 to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ to 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

		Seamless		Electric Weld	
OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	$86.12
6-in. to 24-in. del'd New York	84.18
6-in. to 24-in., Birmingham	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	100.90

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts	*Percent Off List*
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed
(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller		46
½ in. and smaller	44	..
½ in. through 1 in.		44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts	
Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets	*(½ in. and larger)* *Base per 100 lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets	*(7/16 in. and smaller)* *Percent Off List*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws *(In packages)*	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	56
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31½¢
Copper, reduced, 150 and 200 mesh	29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	8¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	$2.00
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 100 mesh	51½¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	8½¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	$3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	$2.65
Under 100 lb	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
New England, del'd	19.75
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, del'd	17.83
Swedeland, Pa., f.o.b.	16.90
Buffalo, del'd	18.75
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	15.76

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	*Carloads, Per* 1000
No. 1, Ohio	$64.00
First quality, Pa., Md., Ky., Mo., Ohio	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo, Ohio	64.00
Sec. quality, New Jersey	59.00
No. 2, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

Silica Brick	
Pennsylvania and Birmingham	$70.00
Chicago District and Alabama	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$59.00
Magnesite Brick	
Standard, Balt. and Chester	$81.00
Chemically bonded, Baltimore	70.00

Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in bulk	$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00

Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest; add 10¢; Missouri Valley; add 20¢	$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.47	$5.73	$5.82	$4.78	$5.68	$4.82	$4.55	$4.83	$5.53	$8.34	$8.44	$9.88	$9.95
New York	4.71	5.72[1]	6.11	5.03	5.86	5.06	4.75	5.02	5.57	8.40	8.50	9.92	10.02
Boston	4.76	5.63[12]	6.16[12]	4.76	6.73	5.11	4.82	4.98	5.63	8.62	8.72	9.98	10.08
Baltimore	4.31	....	5.71	4.76	....	4.76	4.68	4.81	5.51	....	....	....	....
Norfolk	4.80	....	....	5.20	....	5.05	5.05	5.10	5.90	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.429	5.279[1]	5.829	4.529	5.829[5]	4.779	4.579	4.579	5.279	8.379	8.479	9.629	9.729
Cleveland	4.25 }	{4.95	5.78	4.52	5.00	4.60†	4.65	4.40	5.10	8.33	8.43	9.30	9.49
Buffalo	4.25	5.10	6.00	4.70	5.65[5]	4.95	4.40‡	4.40‡	5.10	8.05	8.15	9.30	9.40
Detroit	4.35	5.20	6.02	4.72	5.63	4.88†	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	....	....	....	....
St. Louis	4.58	5.43[1]	5.87	4.68	5.82	4.88	4.73	4.73	5.47	8.57	8.67	9.82	9.92
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
St. Paul	4.63	5.48[1]	5.88[2]	4.73[7]	....	4.93[7]	4.78[7]	4.78[7]	5.91[6]	....	....	....	....
Omaha	4.868	6.118[1]	6.468	5.168	....	5.418	5.218	5.218	5.918	....	....	....	....
Indianapolis	4.553	6.324	5.874	4.653	5.753	4.903	4.703	4.703	5.403	....	....	....	....
Birmingham	4.45[11]	....	5.65	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.04	....	....	....	....
Memphis	4.82[11]	5.87	6.37	5.02[11]	....	5.17[11]	4.97[11]	4.97[11]	6.12	....	....	....	....
New Orleans	*4.98[11]	6.29[1]	....	5.18[11]	....	5.33[11]	*5.03[11]	*5.13[11]	6.29[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.80	9.40[17]	9.20[17]	10.35[17]	10.45[17]
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
San Francisco	5.40[8]	6.65	6.85	5.75[8]	....	5.50	5.20	5.05	7.50[10]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.55[16]	....	11.15[16]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) 1000 to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 35¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....
Birmingham	32.88– 35.88	33.38– 36.38	.....	.....	.....
Buffalo	36.00– 39.50*	36.00– 40.00*	36.50– 40.50*	.....	.....
Chicago	35.50	36.00	36.50	37.00	.....
Cleveland	35.50– 39.25*	36.00– 39.75*	36.50– 40.25*	.....	.....
Duluth	36.00	36.50	37.00	37.50	.....
Erie	35.50	36.00	36.50	37.00	.....
Everett	.....	45.00	45.50	.....	.....
Granite City	36.50	37.00	37.00	.....	.....
Neville Island	36.00	36.50	36.50	37.00	.....
Provo	36.00	36.50	.....	.....	.....
Sharpsville	36.00	36.50	36.50	37.00	.....
Steelton	37.00	.....	.....	.....	42.00
Struthers, Ohio	36.50	.....	.....	.....	.....
Swedeland	41.00	41.50	42.00	42.50	.....
Toledo	35.50	36.00	36.50	37.00	.....
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00
Youngstown	36.00	36.50	36.50	37.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.30	.....	.....	.....	.....	47.30
Brooklyn	Bethlehem	3.30	40.30	40.80	41.30	41.80	.....
Cincinnati	Birmingham	5.36	38.24– 41.25	38.74– 41.74	.....	.....	.....
Jersey City	Bethlehem	2.02	39.02	39.52	40.02	40.52	.....
Los Angeles	Provo	6.53	42.53	43.03	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	38.06– 41.81*	38.56– 42.31*	39.06– 42.81*	39.56	.....
Philadelphia	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Philadelphia	Swedeland	1.11	42.11	42.61	43.11	43.61	.....
Philadelphia	Steelton	2.38	39.38	.....	.....	.....	44.38
San Francisco	Provo	6.53	42.53	43.03	.....	.....	.....
Seattle	Provo	6.53	42.53	43.03	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	37.25	37.75	37.75	.....	.....

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* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$45.50; f.o.b. Buffalo—$46.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $50.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, $56.04. High phosphorous charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	172.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.00	8.25	8.80
Ton lots	9.00	9.60	11.50
Less ton lots	9.40	10.00	11.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C. 0.06% P, 90% Mn	23.00	24.10	24.70
0.10% max. C	22.50	23.60	24.20
0.15% max. C	22.00	23.10	23.70
0.30% max. C	21.50	22.60	23.20
0.50% max. C	21.00	22.10	22.70
0.75% max. C, 7.00% max. Si	18.00	19.10	19.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	7.40
Ton lots	8.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	7.65
Ton lots	8.65
Less ton lots	9.05

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $73.00 f.o.b. Keokuk, Iowa; $73.75 f.o.b. Niagara Falls; $70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	18.50	19.85	21.60
97% Si, 1% Fe	18.00	20.25	22.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	4.80	5.05	5.25
Ton lots	5.80	6.40	6.70
Less ton lots	6.20	6.80	7.10

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	8.80	9.30	9.50
75% Si	11.20	11.50	12.25
80-90% Si	12.70	13.00	13.75
90-95% Si	14.35	14.65	15.35

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	25.00	25.40	26.00
0.10% C	24.50	24.90	25.50
0.15% C	24.00	24.40	25.00
0.20% C	23.75	24.15	24.25
0.50% C	23.50	23.90	24.00
1.00% C	23.00	23.40	23.50
2.00% C	22.50	22.90	23.00
65-69% Cr, 4.9% C	17.60	18.00	18.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	11.10	11.35	11.45
Ton lots	12.00	12.90	13.50
Less ton lots	12.40	13.30	13.90

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	18.70	19.10	19.25
Ton lots	19.90	21.20	22.00
Less ton lots	20.60	21.90	22.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	23.00	23.40	23.50
Ton lots	24.35	25.00	26.20
Less ton lots	25.35	26.00	27.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	91.00	92.50	93.75
0.50% max. C	87.00	88.50	89.75
9.00% min. C	87.50	89.00	91.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.35	20.50
Less ton lots	18.60	19.35	21.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	16.75	17.25	19.30
Ton lots	18.85	19.70	21.45
Less ton lots	19.85	20.70	22.45

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	17.25	18.35	20.30
Less ton lots	18.00	19.10	21.05

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.05	16.15	18.10
Less ton lots	15.80	16.90	18.85

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.50
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2A_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton	$65.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	6.90¢
Ton lots	7.40¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.			
Less ton lots	$1.30	$1.3075	$1.329
Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.			
Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.			
Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	37.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed on 50 lb and over	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.	
Ton lots, per pound	8.0¢